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INFECTION, ITS AGENCY, AND INFLUENZA.*

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I HAVE chosen as the subject of my remarks, the disease which we have seen working such wide-spread mischief upon the horses of the metropolis for several weeks past. It has suddenly appeared amongst us, giving no indication of its origin, and with the same insidiousness has made its steady progress. Our thoughts, then, must surely have been directed to the general topic of infectious disease; what is its cause? what the conditions which lead to or favour its appearance? upon what agency does it depend for its transmission? and are any means discoverable of preventing its outbreak, or guarding animals against its attack?

That this Epizoötic Influenza is infectious, I am convinced. Some there may still be among us who believe it has not this character, but facts appear to me to favour the opposite conclusion. Certain it is, that upon our opinion concerning this question will our idea of the whole nature of the malady hinge; for were it not dependent upon any specific organism for its production, and not by this means passed from one animal to another, we might look for its cause solely to disturbances in the forces of nature around us—in the electrical or other condition of the atmosphere acting upon the nervous system.

In such case, the disease produced would not be transmissible; we should neither trace its appearance to the advent of a par-

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ticular animal, as in some instances we now can, nor should we find in the location, definite course, and mode of dissemination of the disease, those facts which impress upon the minds of most of us the conviction of its infectious nature.

Grant it this attribute, and it follows that we must look for its cause to some tangible contagium; there must be an invasion of the system by a specific infecting organism, which, finding a congenial habitat, reproduces agents of like virulence, and powerful to produce identical symptoms in animals of the same species.

Its name, Influenza, given it by Italian physicians, signifies that it was early looked upon as due to some occult influence, whether planetary, atmospherical, or telluric; and in endeavouring to account for an epizoötic outbreak, we must give some weight to predisposing circumstances, such as atmospheric or geological conditions. We frequently find the occurrence of this disease following some unusually perturbed state of weather; such changes produce a state of system favourable to the epizoötic, possibly have some effect upon the contagium itself; and these views imply that the elements of disease are often around us, lying in wait, as it were, for circumstances favourable to their development. This is no improbability.

Infectious diseases have long been considered to owe their communicability to a specific form of matter excreted from the body; though opinions have differed as to the form in which the contagious material was found, whether in solution, in a state of fluidity, or merely suspended in the virus. Recent investigations with improved means of research have vastly increased our knowledge concerning the origin of disease, and the offending agent is proved to be among the more or less easily distinguished solid particles contained in the virulent secretion or discharge.

Since the discoveries of Tyndal and Pasteur, these minute bodies have been popularly known by the title of "Germs;" and of late, microscopy has made us familiar with many of their different forms, as Bacteria, Bacilli, Micrococci, Vibriones, Spores, etc. For a description of them I may refer you to the paper read before us here by Mr. J. H. Steel (VETERINARY JOURNAL, 1879, vol. ii.). The attention of the medical world has been

drawn to micro-organisms as germs of disease; a review, therefore, of some of the general characters of these bodies will not be out of place before bringing our minds to the consideration of any one of the group of infectious disorders. We may speak of them generally as micro-organisms or disease-germs; they have been more specially alluded to as Microzymes, Microphytes, and particles of bioplasm.

A great obstacle to their investigation is their extreme minuteness, the particles observed by Beale in vaccine lymph being estimated at 1-20,000th of an inch in diameter; there is also the difficulty attending their isolation, and in preventing the subsequent access of germs foreign to those which it is desired specially to cultivate or examine. From their readiness of diffusion and small size, we can understand the oft-apparent mysteriousness of infection. Disease-germs arise solely from pre-existing germs, and do not spontaneously result from tissue change. I see no more difficulty in comprehending the production of the first Typhus germ or Anthrax bacillus than of the primal tænia, trichina, or even any type of living organism, though possibly in course of time some mutations or modifications have taken place with disease-producing germs as with higher forms of life.

In very many specific infectious disorders, a special organism has been identified or isolated, and experimented with; and it is found that the products of any one kind of germ will cause, on inoculation, just that disease in which the original germ was reared; this has given rise to the doctrine upheld by Pasteur, that each infectious disease has its own special organism. This theory has its opponents, who maintain that one kind of spore or bacillus may be so altered or modified under differing conditions as to produce diverse diseases; and it does seem a question for speculation whether the virus from one species of animal may not, in the organism of another species, manifest its baneful presence by a dissimilar train of symptoms.

One great point of difference between disease-germs lies in their respective powers of causing injury to the system—how harmless is Epizoötic Eczema, in comparison with the Cattle Plague.

So, also, they vary in the site they affect in the body, and in

the rapidity of their growth; this latter difference will be found with germs of the same kind, according to the suitability of the soil or the presence or agreement of the conditions necessary to the successful ingrafting of the pestiferous organism; thus, some animals will escape the influence of the most easily sown disease.

From pathological reasoning, we infer that there is within the animal system a *pabulum*, a material for nourishment, or that which may figuratively be referred to as the soil, which is necessary to the growth and increase of bacteria and their kindred organisms, and there are varying conditions of system which increase or decrease this *pabulum*, which render this "soil" more or less fitted for their reception and growth. It is upon this hypothesis that we explain how it is that of two animals of one species, one suffers much from a certain malady, the other little, or, it may be, escapes it altogether; by it also we account for the still more astonishing fact that some infectious disorders, even of great virulence, are harmless to animals of certain species; witness the immunity of the equine race from Cattle Plague, and the freedom enjoyed by man from many of the Epizoötics affecting animals, though, unfortunately, not from all. A peculiar example of the same exclusiveness is the great degree of resistance displayed by Algerian sheep to inoculation with Anthrax virus, as discovered by Chauveau.

Disease-germs may find their entry to the animal in many ways, as by transmission through the mucous membrane of the air-passages or alimentary tract, also through wounds or abrasions of the skin. After successful invasion, different kinds vary in their mode of procedure; some run a definite course, and then become eliminated from the system, others never leave the animal perfectly free from their presence, even though there is apparent recovery from the disturbance they produced.

The inherent vitality of these micro-organisms is exceedingly great; they will withstand a great degree of heat, and some amount of desiccation; while under favourable conditions they have maintained their virulent power for an astounding period. There is the statement that Anthrax bacilli have been found in

a condition of vitality in pits where the carcases of diseased animals had been buried ten years, and they have, marvellous to relate, been proved to have been brought to the surface of the soil through the medium of earth-worms (see the address by Dr. Cameron, VETERINARY JOURNAL, November, 1881)—a strong argument this is in favour of cremation; the carcases of animals affected with virulent disease ought certainly to be so destroyed.

The power of these minute particles to resume their activity after a lengthened dormant condition suggests the parallel of vegetable seeds, though of course the time during which these may retain vitality is far greater, as exemplified in the case of plants grown from seeds found buried with the mummies of Pharaoh's Egyptians. Bacterial spores and the like are not, in any actual sense, seeds, but their extraordinary vitality and specific properties should bespeak for them a particular and special entity. Inanimate particles of matter from diseased bodies would surely not manifest these characters, neither scarcely would formless portions of bioplasm.

Disease-organisms received into the system do not at once give rise to untoward symptoms; a period of incubation ensues, during which the growth and multiplication of the agent progresses, or while, in some cases, as in Rabies, or Glanders, the germs are immured till some condition of the animal system evokes their activity. It has been hinted ("Essay on Hydrophobia," by Dr. Ewart, *British Medical Journal*) that not only might a dog with merely the virus of Rabies in a state of incubation fatally inoculate man or animal, but that possibly such dog might so spread the disease without itself ever subsequently developing any rabid symptoms; such are the speculations evolved by the progress of the "Germ Theory." Consideration of Glanders has led me to believe that its contagium may be received by an animal, and stored harmlessly away till its virulency is called into play by some unhealthy or exciting conditions; also that, after apparent recovery, the same retention of germs with subsequent outbreak may occur.

No fact in connection with virulent germs is more astonishing, and none has given rise to more thought and speculation, not to

mention fruitful experiment, than the circumstance that one invasion of the system by a crop of disease-organisms protects the animal form from subsequent inoculation by similar germs, for a long period in some cases, for a certain time in nearly every instance. Various reasons for this have been suggested. It has been said to be connected with the noxious poison which would seem to be developed during the increase of some micro-organisms. The common explanation is based on the exhaustion of the "soil"; for it is a moot point whether more than one species of organism may not require and consume the same pabulum, and thus "protect" for each other.

Vaccination first indicated how a modified disease may "protect" against a virulent one, and lately M. Pasteur has, by his wonderful researches, discovered means of so successfully attenuating the germs of Fowl Cholera and Splenic Fever that a "vaccine" has, so to speak, been found to protect animals from inoculation by these virulent maladies.

Toussaint, Klein, and others, have likewise brought valuable facts to light bearing on this subject. Also the experiment has been ventured upon of injecting the virus of disease into the blood-vessels, with the astonishing result of rendering the animal operated upon proof against that disease, while at the same time causing little systematic disturbance through the operation. This has been carried out with Rabies virus by Galtier, of Lyons. With the germ origin of disease in view, the treatment of Yellow and Malarial Fevers in the human subject has been successfully undertaken by injection of Carbolic Acid into the circulation. This seems a valuable field for experimental inquiry.

Returning to the particular disease under consideration, Influenza, we take it that its immediate cause is the attack of a special organism; the nature of the malady thus established is febrile, characterized by much nervous depression and weakness, with inflammatory catarrh of the respiratory, ocular, or intestinal mucous membrane. The respiratory and ocular membranes are most commonly affected, and accordingly, as we find its effects more apparent in one or other part of this tract, so we have the catarrhal and conjunctival, laryngo-pharyngeal, or the thoracic form. The incubation is short—not longer than a few days, at

the end of which we see the first effect of the disease upon the nervous system. The animal has a "chill," or rigour, varying from a slight coldness of surface in the one case to decided shivering in another.

(Referring to impressions on the nervous system, I might mention that Pasteur found that the bacterium of Fowl Cholera, during its growth, gave rise to a special narcotic poison, which he proved was due to the peculiar drowsiness invariably shown by the sick birds.)

Pyrexia is the next manifestation, the temperature ranging from 103° to 105°, or occasionally higher; local symptoms are then exhibited, varying according to the part affected.

Influenza is markedly asthenic in character; the reduction of the patient's strength is great; there is much muscular exhaustion and weakness during convalescence; another peculiarity is the tendency to anasarcous swellings in the legs and other parts, The inflammatory symptoms shown, though sometimes persistent, are not violent or acute, and have a decided tendency so terminate in resolution. Its symptoms appear to me to correspond exactly with those we might expect to follow the invasion of the system by a deleterious organism which had a definite course to run, and was in due time cast off, and do not seem to indicate so much the transient impression of any physical or chemical agency, as may be the case with an ordinary cold or lung congestion.

That which is looked upon as the simple form is the catarrhal, which usually involves the conjunctivæ. Simple it is, because attacking parts whose inflammation is more easily subdued and less irritating to the system than inflammation of the more sensitive throat and chest. Another reason why the ocular type of Influenza is so manageable, is that the symptoms are so prominent, and the appearance of the sufferer so pitiable that the case comes earlier under our notice.

We find the horse very dull, with its head dependent, its appetite gone, the eyelids much swollen, sometimes closed, with lachrymal secretion or muco-purulent discharge issuing from the palpebral fissure; there is intolerance of light and of interference with the suffering eye. Sometimes both eyes are so affected, occasionally one only. On separating the hot and

tender eyelids, the conjunctiva will be found much inflamed and turgid, and frequently a clouded condition of the cornea is visible, or sanguineous effusion within the eye at the lower part of the anterior chamber.

There is sometimes mucus discharge from the nostrils, with injection of the Schneiderian membrane. Respiration is a little quickened and laboured; the pulse 56, 60, or even 70, frequently very irregular and weak in character; the temperature about 104°, external temperature unequal, extremities generally cold.

The fever will be found to be of short duration, it may be from two to four days; the eyes then clear, and the lids open, while the appetite and cheerfulness are regained, but then ensues a somewhat tardy and weakly convalescence, engorgement of the hind limbs, sheath, or inferior part of the abdomen being not unfrequent.

In another case we may find profuse discharges from the nostrils, submaxillary glandular enlargement, and more or less laryngeal inflammation. I lately attended a horse which was a new arrival in a stable containing two other horses. The symptoms presented were sore throat, with irritable cough, adhesive discharge from one nostril, and induration of the submaxillary gland corresponding. Recovery soon occurred, but in a few days the two other horses were attacked by the epizoötic in the bronchitic form.

At other times the symptoms are almost exclusively confined to the throat and pharynx; there is harassing cough, protrusion of the head, much dysphagia and flow of ropy saliva, and usually either the severity of the laryngeal or pharyngeal symptoms will preponderate; abscesses occasionally form in the submaxillary space or parotideal region, and, should these not progress naturally, the danger of pyæmic abscesses will follow.

Broncho-pneumonia has been the type taken by many cases under my care during the recent outbreak; in some a sudden attack of hurried impeded respiration has called attention to the patient; in others, a cough has been present for some days before the animal was considered ill enough for veterinary supervision, and the symptoms have been as follows, taken for example, at about the sixth day, when the first febrile symptoms have somewhat sub-

sided. The patient paws at times, has an occasional cough, which is sometimes hard and indicative of pain, at other times low and soft, wanting in resonance; respirations 30 to 36 per minute, expiration being quick and forcible; the respiratory murmur is replaced by a harsh sound; there is still some impairment of appetite, and the animal will not lie down; pulse 48, temperature 103°. Progress in these cases has been exceptionally slow, and only by stages, no daily change being observable, the patient maintaining the same symptoms for, say, five days, then on the sixth the pulse, breathing, and other symptoms being decidedly improved; remaining then at the same point for another few days.

The following have been the symptoms at about the twelfth day: pulse 40 or 44, temperature 101°, appetite good, cough in many instances ceased, the number of respirations reduced from 20 to 26 in the minute, but their character being little altered, the expiration being forcible and blowing. The restoration of lung and bronchi to healthy tone has in some instances occupied two or more additional weeks, notably in cases where the debility has been most marked, as in old horses, in those that have had aperient medicine injudiciously administered, or have been kept at work too long.

Intermittence of pulse has been a frequent accompaniment of convalescence.

Irrespective of theories as to the nature of Influenza, experience has indicated the line of treatment necessary, and accordingly we endeavour to counteract the nervous depression by stimulants, specially avoiding any depleting measures or medicines, and concentrate our energies on maintaining and supporting the strength of our patient by careful attention to his comfort, by the selection and preparation of nourishing food, and the timely administration of strengthening medicaments.

A vast deal is accomplished towards success in treatment when we can get the patient into a comfortable well-ventilated loose box, with his legs well bandaged, and his body warmly clothed, according to the requirements of the season; and though we cannot sometimes have all that we would desire in this direction, we should endeavour to promote the warmth and comfort of the patient as much as possible. Warmth, to a reasonable degree,

is an essential tranquillising agent to the nervous system, and an important feature in the hygienic treatment so necessary, if we would shorten the duration of the convalescent period. Here I would speak a good word for the employment of stoves in damp or unhealthy stables, as advocated some years back by Mr. Greaves. I have often had occasion to be thankful for their assistance in purifying the air, freeing it from clammy moisture, or unhealthy emanations. I would also recommend the free use of disinfectants in many stables.

When the treatment of Influenza is commenced early, there will seldom be cause for anxiety; the severity of the symptoms soon abates, and the patient progresses steadily towards recovery. But if the fever has become well established, and inflammation has attacked the throat or chest, much care will be needed, and the call on the animal's strength will be great; but how much more is this the case when the horse has been kept at work while ailing, as not uncommonly happens; the early febrile symptoms have been overlooked or disregarded, the poor animal's palate pricked or cut for imaginary "Lampas," to remedy his loss of appetite, or a cough ball given, but no rest allowed. It is then we meet with those cases of utter prostration, when the limbs ache with pain—the animal shifting from one forefoot to its fellow and resting his weight first on one hind leg, and then immediately on the other, but refusing to lie down. Slings are imperatively called for in such a case, yet not alone in such extreme instances, for there are many in which slinging should be resorted to, if only for a few hours at a time, and with the simplest of improvisations in apparatus. When chest complications and weariness of limbs are evinced, the continuous standing has an injurious debilitating influence, through loss of muscular and nervous force. Much time will therefore be saved by economising the patients' strength, sometimes even life will be spared by this means. I have certainly been able to attribute my patients' recovery to the timely support of the slings in some instances. I took occasion to remark upon the advantage of slinging in this disease in a contribution to the *Veterinarian* for 1870.

We cannot over-estimate the value of rest, how beneficial it is, and what an all-important adjunct to our prescription; yet when

the patient is compelled to stand in the distressful condition I have attempted to describe, how can it be enjoyed? The support given by slings, however, fulfils the desired conditions to a great extent, the animal soon making use of them, to his ease and comfort.

Foremost amongst medicines, I mentioned stimulants. Useful agents in this class which we may employ, are carbonate of ammonia, brandy, nitric and chloric æther, judiciously chosen, or combined according to circumstances, and given in small and oft-repeated doses.

In diseases of this nature Ammon. carb. well merits the advocacy devoted to it by Professor Walley (VETERINARY JOURNAL, 1879, vol. ii.).

We shall also derive advantage from the cautious use of such salines as Potass. chlor., Potass. nit., or Magnes. sulph., when the febrile symptoms are severe. Aconite tincture and belladonna may also be required, and it will be found beneficial to administer tonics early in the case—for example, gentian, cinchona or oak barks, and iron in the later stages. I have employed mustard stimulation to the throat and breast with benefit when the cough has been troublesome, though extensive irritating applications to the side will not prove of use, but tend to annoy and exhaust the patient to no purpose. In cases with rapid impeded respiration, I have had layers of spongio-piline soaked with warm water bound to the sides; but even then must confess I have not found the advantage from their employment which is gained in ordinary sthenic cases of Bronchitis or Congestion.

The tendency of the malady is towards recovery; we must have patience, directing our attention to securing the comfort and general good management of the sick animal.

The only prophylactic measures at our command are those which aim at rendering the animals, as far as possible, antagonistic to disease propagation. This we can endeavour to do by strict attention to the conditions of work and rules of diet and hygiene, including stable construction, improvement and management.

We may be assured that so long as animals are kept in unhealthy conditions or surroundings, so long will diseases appear to prey upon them.

THE DISTEMPER IN HORSES: 1881-2.

BY A. E. MACGILLIVRAY, M.R.C.V.S., BANFF, N.B.

IT is now about fifty years since the late Professor Dick designated this disease *The Distemper of Horses*, and asserted its strict analogy to *Canine Distemper*. The worthy Professor had no doubt many peculiar ideas as to the nature and dissemination of epizoötic diseases, but in this instance he seems to have adopted the same popular nomenclature for this disorder as has been quite recently promulgated as original by Professor Dieckerhoff, of the Berlin Royal Veterinary School. (See VETERINARY JOURNAL for last November.)

It were needless in me to enter into a discussion as to whether Influenza or Distemper is the more appropriate popular name for this disease; no doubt Influenza is a "world-wide" designation, but that is far from stamping it as the most suitable one; indeed, the adoption of the term Influenza, as we all know, hangs upon a very mythical sort of foundation. Along with Professors Dick and Dieckerhoff, I favour the retention of *Equine Distemper* as the future popular nomenclature for this disease in horses; and concurring with my old teacher, Professor Dick, I have to assert considerable analogy between equine and canine distemper. Professor Dieckerhoff, however, seems indirectly to deny this.

The popular and technical synonyms for this disease are so various and so numerous, as to render their detail quite inappropriate in the present communication.

The year 1881 will be long remembered by the veterinary profession in all parts of the world on account of the almost universal occurrence of this equine distemper in one form or another; from all parts, France, Germany, Belgium, America, etc., we have reports of its prevalence; generally, however, of a mild and not at all fatal description.

In my own practice, since the first week of July I have never been without a good few cases on hand; and at present (January, 1882) I have more cases of the Distemper under treatment than at any one time during that period. I have met with all the phases of the disease—namely, catarrho-nasal, thoracic, intestinal, and even cerebro-spinal. The catarrhal has, however, been the

most common, and very often accompanied by Adenitis and extensive suppuration.

The *thoracic* form was most common during the months of July, August, and September; was generally of a typhoid or asthenic character, often very tedious under treatment, and almost always offering to end in Hydrothorax; the latter, in fact, was the great rock ahead to be feared in all cases of the thoracic form of this epizoötic distemper in horses. I lost one case on the fourth day after attack from Hydrothorax, complicated with previously-existing heart disease; knowing about the heart disease in this patient, my prognosis was unfavourable from the first. Another case, a yearling colt, succumbed from Hydrothorax within twenty-four hours after I first saw him. He must, however, have been ill some days before being noticed; this was rendered extremely probable, owing to his being away in a field at a distance from the farm-steading. Another thoracic case ended fatally from the effects of superpurgation brought on by having inadvertently got a ball containing 9 drms. aloes: there was extensive Hydrothorax in this case. A fourth case, suffering under the thoracic form, had three relapses, gave way under the third relapse, or, as we may say, died under the fourth attack of this equine distemper. In this case the lungs were actually gangrenous.

Not unfrequently the thoracic and catarrhal forms were concomitant; and sometimes the thoracic would finish off with severe nasal catarrh.

When the thoracic form was ushered in by diabetes and swelling of eyelids, sheath, and extremities, I was then sure of a lingering case, requiring every care and attention. In such cases the thermometer often ran up to 106·5°; this was, with one or two exceptions, the highest observation made.

In the catarrhal form, when accompanied by Adenitis, the suppuration generally took place in the sublingual or parotid glands, very often the former. I had several most inveterate suppurations of the parotid, the gland continuing enlarged for weeks and requiring opening in two or three different places. In one case, a half-bred horse, an immense abscesss, very deep-seated, took place between shoulder-joint and tracheo-inferior

cervical region. This patient was off work for eight or nine weeks, and in the end I was forced to throw him down and cautiously lay the abscess well open, when I found a pretty large piece of dead gland or muscular tissue, fully three inches from outside, which having extracted, and washed out the remaining cavity with a weak aqueous solution of carbolic acid, recovery soon ensued.

Intestinal catarrh at times accompanied the thoracic form, and then the weakness became very much aggravated, the patients staggering and swaying from side to side on the least attempt to move them. In two or three cases diarrhœa and diabetes were concurrent in the same patient.

I had a good number of instances of the purely intestinal form of Equine Distemper, where, if it had not been for the high temperature, 105° up to 106·5°, I would have said I was treating simple diarrhœa: great dulness and prostration in these cases.

Speaking of the intestinal phase of Equine Distemper, brings to my recollection a rather remarkable affair about two well-bred setter pups; these pups were observed, in September last, to be off their food, dull, and quite languid; the party in charge, an under keeper, gave each of them a pretty strong purge,—*and they were both dead within twenty-four hours!* Poison was now suspected, and the two dead pups were brought in to me for *post-mortem*. The stomach and intestines of both were literally *perfectly empty*, not one atom of food of any description to be found in them! The walls of stomachs and intestines were greatly infiltrated, and consequently much thickened. On slitting open the thickened intestinal walls, serum oozed out quite freely. In both the throat was infiltrated, and in one quite black; in the other there was a lump inside the throat, laterally, as large as a blackbird's egg. Lungs in both were freely ecchymosed; cardiac thrombi in both, very firm, and slightly attached to valves. Yellow fibrous plugs in some of the larger arteries. In fact, the two pups had been seized with Distemper, and very likely succumbed to superpurgation; at least, such was my report to the head keeper.

The *post-mortem* appearances presented in the two pups closely resembled those seen in the mare which died from su-

perpurgation (*ut supra*) while labouring under Equine Distemper. Whether, therefore, the subjects of "The Distemper" be canine or equine, it is a most dangerous, I may say fatal, practice to administer a purge. If there be any doubt as to whether the patient is labouring under Distemper, we have only to apply the thermometer *per rectum*, and the doubt will almost invariably be solved. There is, therefore, no excuse for administering purgatives in such cases.

In several communications and essays which have recently appeared, at home and abroad, in regard to this epizoöty, reference has been made to cerebro-spinal complications; these are very often quite serious, ending fatally. In the naso-catarrhal form, with accompanying Adenitis, we may have abscess within the cranial cavity; very fortunately no such case occurred in my "1881" experience. In the thoracic form, with effusion, the latter often occurs about brain and cord, producing the well-known coma, staggering gait, and pressure with head against wall or forestall. During the present outbreak I have met with all these results.

A most peculiar sequel occurred in a seven-year-old mare, which had a severe attack of the catarrhal and adenitic form. During and after convalescence this mare became subject to a sort of fits; she would suddenly throw up her head, and, after wriggling about for a moment or two, tumble right over sideways, with all her feet in the air! I happened to be at hand during the first attack, and I actually thought the horse was about to die. These fits occurred at any time, while walking for exercise, while the person who worked her was on her back, while in the plough and in the cart; at last while tumbling in the cart the two shafts of the same were broken; so after this the horse was thrown idle and put under proper treatment, and I am glad to say that she is now, at all times and in all work, quite free from these fits.

My treatment for this distemper consisted of *stimulants* internally and externally, along with tonics and, where necessary, laxatives. Where there was severe Adenitis I always applied a strong blister externally, but never, in any case, did I have recourse to poulticing, as I consider the latter very antiquated and unprofessional, and likewise not a little hurtful afterwards.

I conclude by recording one interesting outbreak of the intestinal form of this epizoöty. It occurred on a farm where there are seven horses; one of these was working off the farm one day, and on the following day was attacked by diarrhœa, accompanied by great weakness, loss of appetite, and high temperature. Within ten days all the horses on the farm, from one to ten years of age, were attacked in a similar manner by this intestinal catarrh, being without doubt merely a phase of the all-prevailing epizoöty, "The Distemper in Horses," vulgarly called "The Dumb Cold."

EQUINE DISTEMPER.

BY ADAM SIEVWRIGHT, M.R.C.V.S., TARLAND, ABOYNE, N.B.

A NUMBER of cases of this disease having occurred in my equine practice during the month of December last, of rather an unusual nature, I have thought it necessary to jot down the following notes for publication, the more especially as I have come to the conclusion that I had merely to deal with a peculiar phase of the all-prevalent "Horse Distemper."

In general, the following were the chief and characteristic symptoms observed, namely, suddenness of attack, great prostration, unwillingness and inability to move, sometimes pain and excessive agitation, occasional shiverings and, concurrent with same, coat standing on end; swellings about legs, sometimes before and sometimes behind; swellings about eyelids, with profuse weeping; much increased discharge of highly-coloured urine; bowels slow to move; all mucous membranes pinkish in colour—resembling, in fact, pink blotting-paper. In one or two cases patients went down and were unable to rise. Such were the general, and as I may say, the unfailing characteristics in the present outbreak of the Horse Distemper in this district.

In one or two instances diarrhœa set in on the second day; but in general the bowels were slow to move. When this diarrhœa continued for twenty-four or thirty-six hours, the swellings about the extremities, etc., quickly disappeared.

During what I may call the acute stage of the disease, or rather the initiatory and middle stages, there was no cough; but

when convalescence began, a nasty hard cough set in and continued for some time. This absence of cough during the earlier and middle stages of the disease has led to its being called in the more southern and western parts of Scotland, the "Dumb Cold," under which name it is often mentioned in the daily newspapers.

The first case or two which occurred struck me as greatly resembling the disease known as "Azoturia," but when a good many cases took place over a pretty wide district—I had as many as six new cases in one day at different places—I began to see that what I had to deal with was undoubtedly the "Horse Distemper." It cannot be denied, however, that the extreme agitation shown by some of my patients during the first stage of the attack very much resembled "Azoturia." Fortunately, however, I did not adopt the heroic treatment usually thought necessary in combating the latter affection.

My treatment consisted of, in each case, twelve-ounce doses of Ol. lini. in combination with two-ounce doses of Sp. ammon. aromat., or Ether. nit. sp., with long-continued hot fomentations to the swellings, and succeeding bandaging of legs, and covering the body with one or two rugs. During convalescence, I generally prescribed good doses of Pot. nit. in patient's allowance of water, or Sod. carb. along with nux vomica in mash. In one or two instances I had to sling my patients for a few days.

Up to the time of writing I have not lost a single case; but, I believe, in large towns, where good stabling and pure air are both rather scarce, death has stepped in in not a few cases. Here we country practitioners have the advantage of our city brethren.

PATHOLOGICAL ANATOMY OF BURSATTI.

BY RICHARD W. BURKE, M.R.C.V.S., A.V.D., WOOLWICH.

As this subject is barrenness itself in the literature of Bursatti, a few remarks from me may serve as a nucleus for the deposition of much richer material; this, let us hope, at a not far distant date, when we shall at length have arrived at the very foundation of our search for truth, and thus robbed the disease of that

vehemence and activity which have hitherto characterized it as one of its most destructive and irrepressible features in the results of clinical experience. Until we have reached this point of our search, we may regard science as a delusion, and believe disease beyond amelioration. Individual devotion to science is not known: what would be poverty to some, seems competence to others; and the only evidence of "love for science" apparent in some quarters is manifested in extension in pecuniary success. Whilst others in the profession, united with high accomplishments of science, and having early received a different bias, can scarcely hope for utter obscurity in these days when all scientific acquirement is held in high honour, and its possessors drawn together into a sort of brotherhood by the fellowship of their pursuits.

I digress, however.

We draw nearer now to our own subject, the *post-mortem* characteristics of Bursatti, and this we purpose doing in the following very brief terms:—

In the very large majority of cases the lungs and the liver present the chief seats of the disease in the advanced stages. The lungs, on examination, will be found studded with granular matter of the same description as the so-called *kunkur* of the sores. Similar deposits may be also noticed in the liver and mesentery (J. Burke); occasionally, too, in the splenic investment. But this latter, however, is the seat of deposit only in the most advanced, chronic cases. In a few instances these deposits have been traced about the inguinal lymphatic glands (J. Meyrick); and in the pharyngeal group of lymphatics situated under the guttural pouch (J. Meyrick);* and in the submaxillary lymphatic glands, in close relation to the seat of primary disease—viz., the angles of the mouth or the lachrymal region. The heart, as a rule, does not present any organic change. I have also traced the presence of *kunkurs* in the submucosa of the urethra, occasioning the "squirts," and even giving rise to difficult micturition during the life of the patient, from causing a diminution in the calibre or total obliteration of the urethral tube.

* *Vide* report of *post-mortem* examination of an Arab stallion the subject of Bursatti disease. Office of Commissioner of Horse-breeding Department in India.

In some cases there are very few *kunkurs* traceable in the lungs and pleural membrane, most being located beneath the (abdominal) peritoneum, visceral and parietal (J. Burke).

And, lastly, *kunkurs* have been met with in the bronchial glands, and in the prepectoral group of lymphatics found at the entrance to the thorax (J. Burke).

The Lungs.—The lung-tissue, in the advanced stages, is much increased in its weight and density, is hard to the feel, contracted to the appearance, sinks in water, and emits a creak on section. There is a high coloration of the parenchyma as the result of pressure from the increase in the deposition of the disease-products; but as the process advances, opaque tracts of structure of a somewhat glistening appearance are seen occupying the entire lung-surface, but more especially towards the lower borders. One case which I examined at Hapur was especially illustrative of this change, where almost the whole of the posterior lobe (right?), together with a circumferential inferior border of both lungs of at least two-inch diameter, presented a milk-white, tough, gliding surface: the change being clearly deep-seated and complete—vessels, bronchi, parenchyma, etc., all having undergone one uniform conversion. Kunkurs may be found embedded within this structure.

The Pleura.—The condition of the pleura is also very characteristic. In portions it is very much thickened, tough, resistant, and adherent; and, indeed, one may even liken it in many cases to the dense, stratified, squamous lining of the "œsophageal stomach" of the rat and the horse (Fig. 3, to the left). It gives

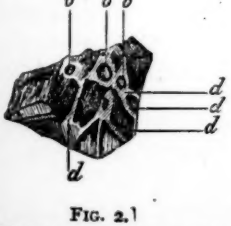


FIG. 2.
b Cavity emptied of its kunkur. *d* Fibrous septa.

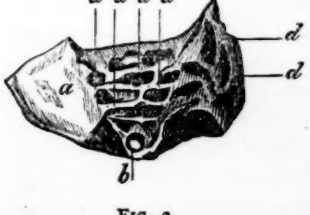


FIG. 3.
a Pleura pulmonalis thickened. *b* Cavity emptied of kunkur (simulating a dilated bronchus). *d* Fibrous septa.

off fibrous processes which traverse the interior of the lungs. In every respect this is similar to Fibroid Phthisis in man.

A section through portions of the lung where the changes are of mid-duration,sometimes presents a marbled appearance (Fig.2) owing to the mapping-out of the lobules from hyperplasy of the interlobular and sublobular fibrous connective-tissue, with the presence of what appear to be *dilated bronchi* (?), some of which are emptied during the act of sectioning (Figs. 2 and 3), others still holding in their interior the *kunkurs* of the disease (Fig. 4); but in the great majority of cases, on close inspection, the "dilated bronchi" turn out to be *cavities emptied of kunkurs*. From the elasticity of the lung-tissue, a section causes a protrusion from the surface upwards of these so-called "dilated bronchi" (Fig. 3), and this appearance still further adds to the belief of the pathologist, at first sight at least, that the above designation is perhaps, after all, true. From the numerous opportunities of *post-mortem* examinations, I am enabled to speak somewhat definitely on this point, and I deny the identity of such a conclusion.

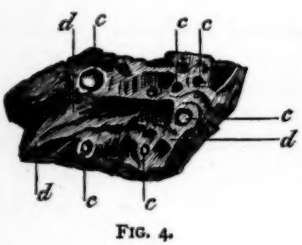


FIG. 4.

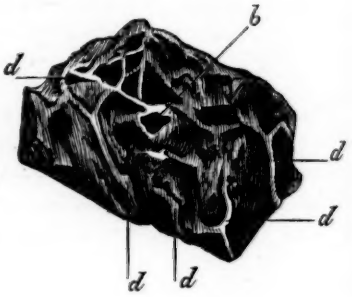


FIG. 5.

b Cavity emptied of its kunkur. *c* Kunkur. *d* Fibrous septa.

In other portions of the lungs, a section presents a more irregular invasion of structures, and fibrous bands or septa are seen traversing the section at irregular angles, and forming a dense fibrous reticulum (Fig. 3). Sometimes these white bands are seen to take the course, and divide in the manner, of a large bronchus or a blood-vessel (Fig. 6).

In places, the interlacing fibrous septa have undergone calcareous change, and grate against the knife.

A special and remarkable feature of the disease is, that *no suppurative changes* are observed, *post-mortem*, as a rule. And

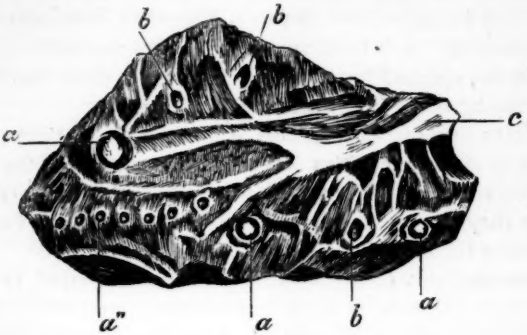


FIG. 6.

a Kunkur. *b* Cavity from which its kunkur has been dislodged. *c* Fibrous septum simulating a bronchus. *a''* Kunkurs running along the course of a terminal bronchus.

in this I meet support in the experience of Messrs. Meyrick, Oliphant, and J. Burke.

John Hunter, writing about human cancer, discerns significance in the above peculiarity:—"The cancer, although it produces a *secretion*, yet does not produce *pus* till exposed; it does not *suppurate* till *inflammation* comes on, and even seldom then, for *true suppuration* arises from *inflammation*."

Dr. Haldane also observes: "In cancer, in but few cases is softening found to have taken place, and when met with, it has been rather the result of *sloughing*, than of comparatively gradual *inflammatory disintegration*."

Dr. Wm. Budd, Cruvelhier, and other eminent pathologists, have noted this same peculiarity in the history of human cancer.

Bursatti-products ("kunkurs"), like tubercle, may permeate all the tissues of an organ, but, as a rule, they maintain the character of *isolated lumps*, causing pressure on the sub, supra, and adjacent textures, without implicating and degenerating them—the surrounding pulmonary substance being pushed aside and compressed. The deposits tend primarily rather to increase

(peripherally) in their own dimensions, and their destructive change, as in cancer-growth, is slow and passive in character. It is very rare for Bursatti-products of the lungs to soften and break down, so as to induce vomicæ; and the latter, I conceive, only result under two conditions:—(*a*). When proliferation of the cancer-cells is unusually active; (*b*) When the *formative* process of cancer-structure is in advance of the *degenerative*—when increase in the circumference of the cancerous nodules (kunkurs) is unarrested by delay in calcareous deposition.

Kunkurs are in many places contained in distinct oval or round and smooth cavities formed in the texture of the lungs, which present the appearance of "dilated bronchi," when emptied. Usually they are continuous with, and non-separable from, the structure of the organ.

Bursatti-nodules ("kunkurs"), though aggregated in *lumps*, do not possess that definite racemosed arrangement which characterises Tuberculosis and Glanders. They, too, may be intimately adherent to the surrounding lung-tissue (Fig. 5), simulating the *post-mortem* manifestation of Lymphadenoma, or they may be in as many places encapsuled (Figs. 4 and 6), and simulate the characters of Tuberculosis. More frequently, however, they present the former condition. Not unfrequently, kunkurs follow the course of a terminal bronchus, *along the chain of lymphatics* (Fig. 6).

The material of Lymphadenoma is intimately connected with the structure of the organ; it never shows a capsule unless it has undergone secondary change; and, according to Green, it never undergoes calcareous, and seldom fatty change; and is thus very different from Tubercle or Cancer (Bursatti).

In Tuberculosis, again, we notice acute retrogressive changes surrounding the tubercular nodules; and this is altogether absent in the *post-mortem* characteristics of Bursatti and Lymphadenoma.

There is another distinctive feature to be considered in the *post-mortem* diagnosis—namely, the peculiar *slimy* condition of the products in organs the seat of Lymphadenoma, which is altogether absent in Tuberculosis and Bursatti, and, indeed, peculiarly symptomatic of the first alone. This condition once seen cannot again be mistaken.

The results of numerous *post-mortem* examinations have, moreover, shown that the putty-like material of the disease (which I have designated *embryonic kunkur*) is first developed usually in the pleura immediately under the endothelial lining—namely, *in the lymphatic tissue beneath*, which gives to the surface-endothelium, in the early stages, a peculiar pinched-in or umbilicated appearance at all points where these deposits are located. In the later stages, through the chain of connection between the lymphatics, it is circulated to the entire pulmonary substance, giving rise to the subsequent "*nodular condition*" of the organ observable in all chronic cases of Bursatti.

The process of kunkur-formation in the lungs is as follows:—Where a cell, nucleus, or the granular elements of a cell, being detached from the sore on the surface of the body and shed into the blood-circulation, has once lodged and "taken root" in any organ—say the lungs—it there becomes a centre-point for the concretion of more; a defective state of nutrition is established at the spot, and fatty or caseous metamorphosis, or fibroid change—cirrhosis—of the deposit or material now formed amidst the histological elements of the lung, is the result, constituting what is called *soft kunkur*, followed by calcareous change in that deposit, forming what is known as *hard kunkur*. Before it has reached to this stage of hardness, a kunkur multiplies in size by constant proliferation* of its cells, peripherally. Having once become hard, it no longer possesses the power of self-multiplication; but *pari passu* with the process of cell-proliferation in a kunkur, and following it, depending on the state of the blood plasma, will be added more calcareous matter by a process similar to that by which fat attracts fat, or bone bony matter. Perhaps the process may not inaptly be compared with the process of crystallization. Be this as it may, the kunkur continues growing, and will often attain the size of a hemp seed, large pea, or even a bean. Subjected to pressure in active growth, it will now flatten and assume an infinite variety of shapes.

* Just as a minute particle of a pus-corpuscle, if transplanted to a suitable new soil, may grow and give rise to new pus-corpuscles, having precisely the same properties, so the most minute particle of a Bursatti-cell may, under favourable circumstances, give rise to the production of cell-forms exactly resembling those in the original sore seen on the surface of the body.

The microscope shows a kunkur to be—most cellular when young; less cellular and more fibrous when older; and least cellular, less fibrous, and more calcareous when oldest in its growth.

There is no conversion into bone*, but the process is one of simple infiltration, with particles of calcareous matter found in normal solution in the blood. Examination of a *kunkur* by transmitted light will show these particles in the form of dark, opaque, irregular spots, scattered throughout the histological (pathological?) elements amid which they have been deposited, and can be discerned under a comparatively low power of the microscope. To examine these microscopically, it is perhaps best to select *kunkurs* in the mid-duration of their growth, when the process of sectioning will be rendered easier, otherwise the *kunkur* must first be subjected to the process of softening, as that done in the case of osseous structures—viz., by maceration in chromico-hydrochloric acid solution.† Maceration in very dilute acids, however, has one advantage,—it dissolves the connecting cement, loosens the granules, fibres, etc., and, in fact, renders all the structures more distinct. Practically it is attended with one disadvantage; if too strong it dissolves and renders the structures indistinct. Kunkurs that have been long subjected to preliminary hardening in alcohol, I have found to show the fibroid change most clearly, alcohol doubtless possessing some peculiar property of rendering white fibrous-tissue distinct.

That the process of kunkur-formation, in its later stages at least, consists in a mere deposition of calcareous matter, is further chemically evidenced, and is so simple of proof that a novice can at any time ascertain this for himself by merely pouring a few drops of any of the dilute mineral acids on one of these disease-

* Lamellæ, lacunæ, canaliculi, are all absent, and there is not the slightest evidence of bony formation traceable by the highest powers of the microscope. On the contrary, the calcareous particles are found in loose connection with, and are separable from, the other structures of the mass composing the "kunkur."

† Or, as Beale recommends, prolonged maceration in glycerine; and if a few drops of diluted acetic acid be added to this, the softening process may be carried to a greater extent, and yet without the calcareous matter being entirely dissolved out.

products, when immediately it will be attended with effervescence, with the formation of little bubbles of gas, owing to the decomposition of carbonates, especially magnesic and calcic. In Mr. Shearer's analysis of *kunkurs*, shown by me in the VETERINARY JOURNAL, the latter salt predominated, with the presence of a large percentage of phosphates.

A *kunkur*, receiving, as it does, in its primary stages at least, caseous change, never undergoes the transformation to crude yellow tubercle of Laennec, described by Gulliver and others to be due to the substitution of the interstitial tissues by oil-globules. And in this is to be had one more essential histological difference between a *kunkur* and true *tubercle*.

From simple inspissated pus, a *kunkur* is distinguished by containing an intercellular substance.

A *kunkur*, then, in its different stages, consists of cells, fibrous tissue, granular elements, and a homogeneous gelatinous material or "cement," which holds together the other structures, and gives firmness and solidity to the mass composing the *kunkur*. Often, too, a *kunkur* contains much pigment matter, cholesterine crystals, etc.; but these latter are merely accidental in their presence, and do not explain the etiology of the disease, no more than the bacterium termo, the particular ferment of putrefactive change, so often met with as concomitants of most specific disorders, explains the nature and pathology of Anthrax or Pig Typhoid, for example. And the evidence of imperfect nutrition in the part is to be ascribed to those conditions which favour the formation of the pigment itself. Pigmentary matter and crystalloid bodies met with in kunkurs, are simply the products of normal blood, and indicate prior extravasation. The blood of different animals yields crystals of very different forms.*

If we take up a *kunkur* by itself and examine it, we note that it is hard, roughened on its surface, is quite brittle, and chips when struck with metal—the simple effects of *calcification*, otherwise distinguished under the designations *calcareous degeneration*,

* Consult Dr. Sieveking's account given in "British and Foreign Med.-Chir. Review," Oct. 1853; Dr. Hoppe Seyler's "Handbuch der Physiologisch- und Pathologisch-Chemischen Analyze;" and "Lehrbuch d. Physiolog. Chemie," vol. i., 2nd Ed., 1853.

petrifaction, etc. "And in the plains of Gennesaret, Leimung has uncovered an immense formation of *petrified* cane and wood, such as I have seen in no other place. I carried away a donkey-load on one of my visits to this region."*

The process of kunkur-formation, its maturity at least, is therefore shown to be almost entirely chemical, consisting in a successive series of processes of deposition (absorption?) of calcareous salts (inorganic matter), especially the phosphate and carbonate of *lime*, in the débris of animal (inorganic) matter. A *kunkur* thus far formed, if escaping the further process of secondary softening, ultimately becomes converted into a stony mass or *calculus*—the so-called "metamorphosed mineral tissue" of some pathologists—containing little or no animal substance. In some cases this process is so far advanced that if a kunkur be removed from its primary situation in the lung-tissue, and its moisture allowed to evaporate by exposure to the atmosphere, it will then, being saturated with salts, disintegrate and form an ash. If now it be re-moistened by process of immersion in water for a few days, before it has had time to disintegrate, it will assume a spungy, gelatinous appearance, *by reason of its organic capillarity, or fibrous meshwork it contains.*

FRACTURE OF THE TRAPEZIUM.

BY J. FRASER, F.R.C.V.S., NEWBURY.

FRACTURE of this bone being in my experience a rare occurrence, I thought an account of it might probably interest some of the readers of the Journal. This case also possesses additional interest, from the way in which the injury was sustained. In August last, I was called to see a bay mare, six years old, the property of the Rev. —— said to be seriously lamed in jumping a ditch whilst at exercise. I found her standing with one fore-leg slightly flexed with a small enlargement behind the knee, but no trace of external violence. On careful examination, I could distinctly feel and hear crepitation, caused unmistakably by fractured trapezium. Making inquiry, I learnt that the mare

* "Josephus and the Plains of Gennesaret."

left the stable in the morning quite sound, and was rather "fresh"; but nothing unusual occurred until "taking" a small ditch on one of our commons, when she tumbled on landing on the opposite bank, and fell.

Thinking it useless to treat her, seeing that a stiff knee was inevitable, I advised her destruction. To this the owner would not consent for a moment; therefore I proceeded to treat her, I simply bandaged the leg and applied two wooden splints. over which I placed starch bands; tied her up for a few days, after which I had her turned into a loose box. In one month I removed the splints, and in six weeks the bandages. She gradually improved until she could use the limb pretty freely; still, I do not think she will ever be safe either to drive or ride. A similar accident in a cart-horse is certainly worth treatment, but I question whether it is in any other class, except, of course, in a mare, which could be used for breeding purposes.

It will be observed in this case that I did not use slings. The fault is probably mine, in not applying them properly, but I never yet saw any advantage derived from their use, especially in fractures. I have treated successfully fractures of many of the bones of the limbs, both in horses and cattle, and always allowed them freedom after the first few days.

I notice almost daily what care our domestic animals will take of themselves when injured, if we will only give them opportunity.

ON A HORSE DISEASE IN INDIA KNOWN AS "SURRA," PROBABLY DUE TO A HÆMATOZOON.

BY G. EVANS, M.D., M.R.C.V.S., ARMY VETERINARY INSPECTOR, INDIA.

(*Continued from page* 110.)

14. The tahsildar of Tonk informs me that a great number of horses (he does not know how many) belonging to the zemindars, died of Surra last year; but the disease was not common for twenty years previously, when the whole of the Nawab's horses (about 300) died of Surra. Cattle do not get any disease like Surra. Horses are most subject to it in the beginning of the

cold weather, and most of them live until the time when green wheat is given to them (about the new year); then they all die. No case has ever been known to recover, he says, and therefore no medicine is given.

15. Last year forty-four horses of the 4th Punjab Cavalry were admitted on the sick list for Surra at this post, and they all died. This year, up to the close of last month, thirty horses were reported sick of the disease here. I do not know how many of them died. I saw fifteen, besides five ponies and two mules, at Dera Ismail Khan, not likely to survive. At the present time there are no cases. The post was not occupied by the Punjab Cavalry before last year.

16. *Kot Nusaran, 12th October*, 1880.—Militia post, seventeen sabres. Horses stand in the open; standings clean. The water is obtained from a clear but slow-running river close by, which swells in the rains into a rapid stream. The bed of the river is of sand and pebbles, no vegetation in it; water good. In 1878 thirteen horses (out of seventeen) were attacked with Surra, and all died in the months of October and November; one horse died here lately, supposed to be from Surra. The horses often go on patrol duty, and then they drink water from irrigation channels, which are the same here as at Tonk. Grass and gram good; barley inferior. Surra is not known by the zemindars to affect cattle.

17. *Zam Post, 12th October*, 1880.—Sixteen sabres, 1st Punjab Cavalry. There are covered stalls for sixty horses. Floor of the stalls very uneven, some of them soaked with urine nearly a foot deep. Grass good; gram good; barley husky and with a green mould. Water obtained from a small tank, $6\frac{1}{2}$ by $3\frac{1}{2}$ paces, and $2\frac{1}{2}$ feet deep, covered by a matting, and supplied by a shallow irrigation channel, about a foot wide, full of sedgy growth same as at Tonk. The water swarms with frogs and infusoria. Nine horses 4th Punjab Cavalry were admitted on the sick list with Surra here in 1878, and one last year. All died. No cases yet this year.

18. *Kot Khirghi Post, 13th October*, 1880.—Seven sabres only, 1st Punjab Cavalry, relieved weekly from Tonk. Covered stalls for twenty-two horses. Floor uneven and rather lower than outside, but the soil is not impregnated with urine. Grass good;

gram good ; barley very light and husky. Water good, from the Zam river close under the fort. There is no record of any horse having had Surra here.

19. *Girni Post, 13th October,* 1880.—Fourteen sabres, 1st Punjab Cavalry. There are covered stalls for sixty horses. The floor very stony and uneven, but not impregnated with urine. I found, however, several recent deposits of human ordure in the spare stalls, which made the whole vicinity stink. This was at 10 a.m. The excuse given by the native officer in command was that he thought there was no harm for the men to make use of the spare stalls for a latrine at night, and that the sweeper was at fault for not having removed the nuisance before my arrival! So much for native sanitation. The post ought to be very healthy : it has good water, good grass, and good drainage on a high porous ground, but if the men deposit their own excreta in the stable, no wonder if the horses become ill. The water is obtained from a good clean pucka tank, thirty by forty paces, supplied by a fast-flowing stream over a clean gravelly bed coming from a spring on the side of the hill about half a mile distant. The men bathe in another tank below. There were seven cases of Surra admitted on the sick list at this post in 1878, and four in 1879. They all died. No case this year. I am told that the horses were often exchanged from Tonk, and as the men seldom reported their horses to be ill of Surra in the early stage, it is not possible to say now at which post the horses first got the disease. As every horse which got Surra died, the men were unwilling to admit that a horse had the disease so long as they could avoid it—they persuaded themselves to the contrary from fear.

20. *Jutta Post, 13th October,* 1880.—Thirty-one sabres, 1st Punjab Cavalry. The horses are in low sheds, with a matting cover. The enclosure of the fort is small, and it is far too much crowded, especially for the hot season. This year was excessively trying. I am informed that not a drop of rain fell in the district between the 1st April and the 21st August. The proximity of the hills and the high walls of the fort itself combine to keep the air within as nearly stagnant as possible, and when the summer sun pours its heat down it must be, as an officer said, a veritable furnace. The stable floor is uneven and a little lower

than the surrounding ground, but the earth is not much soiled. Grass good ; gram good. The drinking water is obtained from a tank within the fort, five paces by six, and five or six feet deep covered. The ground close to the edge, where the men stand to draw water, is uneven, and retains a puddle of dirty, black slime. A stick introduced showed about five or six inches of soft mud at the bottom of the tank. Colour of the water dirty, swarming with frogs and infusoria. It is supplied by a shallow winding irrigation channel, one foot wide, coming from the Gomul river, traversing about three miles of irrigated land before it reaches the post. It is choked with sedgy vegetation, and I found several inches of black slime at the bottom of the channel close to the fort, with a green scum on the surface in some places.

21. This post was not occupied in 1878. Last year twenty-two horses were taken ill with Surra here, and all died. This year forty-seven were taken ill belonging to the 4th Punjab Cavalry. I do not know how many of them have died. I saw eleven troopers and two ponies suffering from Surra at Dera Ismail Khan ; they had marched in with the disease from this post.

22. Major Underwood informed me that in May, 1879, the 3rd Punjab Cavalry sent fifty-two sabres and about twenty-five ponies from Edwardes-abad to Jutta Post, where they remained about two months. Nearly every one of those animals died of Surra during the following cold season at Edwardes-abad, and no horse there got this disease which had not been at Jutta. This fact is interesting, not only as showing how prone this station is to the disease, but also that it is not communicable by any ordinary means ; for if it were infectious in the ordinary acceptation of the term, seventy-seven cases of it imported to a station would have caused it to spread. Major Underwood further informed me that the 5th Punjab Cavalry had 150 sabres on the Dera Ismail Khan frontier from 24th January to end of April, 1879, and none of their horses died of Surra when they returned to Kohat. No horse of that regiment was stationed at Jutta. This confirms the common observation of natives and Europeans in this district, that the disease is much more common in the later than in the early months of the year.

23. *Manghi Post, 14th October,* 1880.—Thirty-five sabres, 1st

Punjab Cavalry present. Covered standings for forty-three horses. The fort is much too confined and crowded. Floor of stables uneven, and the soil of some of the stalls soaked with urine about six inches deep. Grass good; no gram given to the horses, but barley, because the latter costs less per pound, and therefore supposed to be cheaper. The barley was better than the average I have seen in India, being plumper and less husky, but no native hand-mill would crush it, and as a consequence the greater part of it passed through the bowels whole with the dung. On this principle of estimating cheapness of food, sand and small gravel would probably be the cheapest food that could be got, and certainly not less nutritious than the barley which cannot be digested. The water is obtained from a tank within the fort, four paces by four, nearly six feet deep, supplied by an irrigation channel like that at Jutta. There is a low wall round three sides of the tank, and a cover to it. I inspected it at six a.m., just after the sweeper had been round; there was a gentle breeze blowing, and I found a quantity of stable litter strewn upon the surface of the water. The water swarmed with frogs and infusoria.

Fourteen horses were reported sick of Surra at this post in 1878, twelve in 1879, and the twenty-six died. This year thirty-six were reported ill with the disease by the 4th Punjab Cavalry; I do not know how many of them have died.

24. *Luni Post, 14th October,* 1880.—Occupied by the frontier militia, thirteen sabres. Standings in the open, in good order. Grass good; gram good; barley bad—hard, shrivelled, with green mould. The water is now obtained from a shallow well dug in the bed of the river, a branch of the Luni, which runs near the fort only when there is rain on the hills. The well is about four feet deep, and there is about a foot of water in it. The water looks muddy, but the solid particles precipitate when the water stands in gurrahs. The water thus obtained through sand ought to be good; it is renewed in the well as fast as it is drawn. This well supplies men and horses. It was made twelve days ago. Last year it was not made before November. Before the well is made each year the water is obtained from stagnant ponds which remain upon the surface of the bed of the river, or else from a "*bund*" or dam made to retain water on the ground for purposes of cultiva-

tion. The water is kept stagnant in the "*bund*" for twenty to twenty-five days. There is a pond not far from the well (a little lower down) from which the water was obtained before the well was made; the water of that pond is now all green, and exceedingly impure.

25. Eight horses were taken ill with Surra here last year, and they all died early in November. Owing to the want of rain last year, and the great scarcity of grass, the horses were fed on chopped straw. Through the season before, during, and after the outbreak, they had no grass of any kind, I am assured; so that grass was in no way the bringer of the virus. My opinion is that the cause of the disease was in the stagnant water which the horses had to drink before the well was made; this was not made until after the horses died. The natives tell me that they continue to use the stagnant ponds of rain-water as long as they can, because it cooks their food better, and they think all the water coming from heaven must be pure; they do not know that the purer and softer the water is the sooner it becomes unfit to drink by remaining stagnant, exposed to the hot sun, and receiving organic matters blown by the wind, etc. There were no cases of Surra here in 1878, nor any this year yet. The zemindars have never heard of Surra affecting cattle.

26. *Zarkani Post, 14th October*, 1880.—Militia post, of thirteen sabres. Uncovered standings for horses in good order. The grass is good now, but in a month or two it will be gone, and horses will get chopped straw. Gram good. The water is obtained from a rapidly flowing stream, three or four feet wide, and over a foot deep, near the fort. There is a constant flow from the hills a few miles off; the bed of the stream is clean gravel, so far as I was able to explore.

27. There were no cases of Surra here this year, nor the last; but in 1878 eight horses died of Surra at this post early in the cold season, besides thirteen other horses belonging to Nawab Nowrung Khan, which were constantly coming to the post for eight or ten days at the time. It was a very remarkably rainy year The zemindars have never heard of Surra affecting cattle.

28. *Draband Post, 15th October*, 1880.—Thirty-five sabres, 1st Punjab Cavalry. Standings raised, uncovered; ground uneven,

soil not much impregnated. Grass good; gram good. Water is got from an open tank outside the fort, seven feet deep, about nine paces by nine, supplied from Draband Zam river, by a shallow dirty irrigation channel; it is very impure.

29. There have been no cases of Surra here this year, but there were thirty-three cases last year, and three cases in 1878; all proved fatal.

DEATH OF A HORSE CAUSED BY THE LARVÆ OF *ŒSTRUS EQUI.*

BY G. TEGG AND SON, M.R.C.V.S., LONDON.

A FEW days ago a rather singular case occurred in our practice, the particulars of which are as follows:—We were asked to attend a horse which had been unwell for a day or two, and which had been employed as a farm-horse upon a farm at Enfield. Upon arrival we found he was suffering from dull continuous pain, and was very weak. He would not eat. On the second day the weakness was more marked, and nothing was eaten. On the third day debility was extreme, and on the fourth day the horse died in great pain, which was evidently abdominal. At the autopsy the stomach was found to be enormously distended with food; ninety-seven "bots" were picked off the mucous membrane of this organ, principally near the pyloric orifice, and the irritation caused by their piercing the membrane with their cephalic hooks at this part had set up such an amount of tumefaction, etc., as to prevent the passage of food from the stomach to the intestines. All the other viscera were in a normal condition.

ON THE LITERATURE OF "DISEASES OF THE ELEPHANT."

BY J. H. STEEL, M.R.C.V.S., ARMY VETERINARY DEPARTMENT.

IT is a matter for regret to comparative pathologists at home, and especially to those veterinary officers who are likely to be called upon to proceed to India at some period of their professional career, that for the last quarter of a century no at-

tempt seems to have been made to produce a systematic treatise on disorders to which elephants are liable. With the exception of accidental notices of elephant diseases in the various works on Indian and African travel and sport, notices occasionally appearing in the professional journals, and Lieut. Ouchterlony's most interesting paper in the *Veterinaran* for 1873, we have nothing ordinarily accessible, and are obliged to fall back upon Assistant-Surgeon Gilchrist's work brought out in 1841, now procurable with difficulty. In our search for the literature of diseases of transport animals, we have occasionally been recommended to the Government Reports on Diseases of Indian Transport Animals, but these certainly are not easy to procure. To assist future workers in this line, we append a list of our references:—

Pathology ...
I. *Veterinarian*, 1873, "Ouchterlony on Elephants. An Essay.
Veterinarian, 1873, Fleming's Analysis of Forsyth's "Highlands of Central India."
II. VETERINARY JOURNAL, 1877, vol. ii., "Intussusception in an Elephant." By V.-S. Benj. Powell.
III. "Records of Cattle Diseases," Calcutta. (Published by the Indian Government.)
IV. Fleming: "Royal Engineer's Manual of Field Service."
V. Gilchrist on "Diseases of the Elephant." 1841. Sanderson on the Elephant in his "Thirteen Years among the Wild Beasts of India."

Natural History ...
VI. "The Lion and the Elephant." By Anderson.—Sir Emerson Tennent, "Wild Elephant."
VII. Williamson, "Oriental Field Sports." "Thirteen Years among the Wild Beasts of India."
VIII. "The Elephant." Knight's Series, 1844.—Hartenfel's "Elephantographia."

Parasitiology
IX. Cobbold, "Transactions of the Linnean Society," 1881. *Veterinarian.*
X. Steel, J. H., *Medical Examiner*, last volume.

Anatomy ...
XI. "Anatomy of the Indian Elephant." By Miall and Greenwood." 1878.
The list of anatomical works given therein.

Those who have examined Gilchrist's works on the camel, bullock, and elephant, will admire the energy he brought to his task, his zeal in extracting practical information from native sources, and his boldness in taking on himself the duty of pioneer in this unbeaten track of medical science. If he bleeds, purges, and generally depletes in almost every disease, he but follows the

medical theories of his time as applied to disorders of lower animals. If he does not launch into scientific dissertations on his subjects, we must remember that our then knowledge of the anatomy and physiology of these animals would not allow him to do so, and he wisely viewed the matter with an essentially practical eye, and wrote for men with very elementary notions on medical science. It may be worth our while to look a little carefully through his work on the elephant, and see if we cannot briefly and in modern language summarise what he has taught us. We cannot help thinking that the knowledge which must have been acquired by those army veterinary surgeons who have had charge of transport animals has remained treasured up in their minds or note-books, instead of finding an outlet through the professional press, simply on account of uncertainty as to what pathologists know, and of what they are ignorant. We may gain a little knowledge by contrasting other more recent statements with those of Gilchrist. The following list of disorders in the elephant is worth careful observation :—

Fever (Gilchrist).

Zaarbahd (Gilchrist) ; Zérbád (Forsyth); { Acute form (Asl) (Forsyth). Chronic form (Sukha) (Forsyth).

Inflammation of the Brain and its Membranes (Gilchrist).

" " Lining Membrane of Facial Sinuses (Gilchrist).

Apoplexy (Gilchrist).

Skin Eruption from Exposure to the Sun (Gilchrist).

Conjunctivitis (Gilchrist).

Opacity of the Cornea (Gilchrist); Due to Indigestion (Forsyth).

Ulceration and Sloughing of the External Ear (Gilchrist).

Progressive Mortification of the Tail (Gilchrist).

Vomiting (Gilchrist)..

Spasmodic Colic (Gilchrist); Intussusception (Powell).

Flatulent Colic (Gilchrist).

Enteritis (Gilchrist).

Purging due to Parasites (Gilchrist, Forsyth, Cobbold, and Steel).

"Rot" (Thacker and Cobbold).

Bloody Urine (Gilchrist).

Asthenia (Gilchrist).

Tetanus (H. T. W. Mann).

Rheumatism (Gilchrist).

Boils (Gilchrist).

Sprain (Gilchrist).

Whitlow of the Feet (Gilchrist) { Káńdi, affects the Sole; Bumboode, Ulceration above Nails. { Cracked Sole (Ouchterlony); Cracked Heel (Forsyth), Sájhan; Bruised Sole (Ouchterlony); Káńdi Heel (Forsyth).

Inflammation of the Lungs (Gilchrist).
Serious Effects of Cold (Ouchterlony).
Foot-and-Mouth Disease seen in Afghanistan Campaign, 1880 (Ouchterlony).
Lying with head down-hill (Ouchterlony).
Galls on Back (Forsyth).
Charbon (Frost).
Sunstroke (Nunn) (see Apoplexy).

In looking through the above list we find several diseases attributable to the sun's heat—encephalitis, inflammation of the lining membrane of the facial sinuses, skin eruption, conjunctivitis, sloughing of the external ear; sunstroke is a combination of the first two diseases; it is prevented in the wild animal by an instinct which leads to the throwing of damp mud to form a coating over the upper part of the head and the exposed parts of the general surface of the body. Leaves and leafy boughs also are sometimes thus used as a protective. We are told by one author that the elephant is enabled to draw from his throat by means of his trunk, a copious supply of saliva (probably fluid accumulated in the pharyngeal pouch), which it spurts with great force very frequently all over its skin. "It also grubs up dust and blows it over its back and sides to keep off the flies, and may often be seen fanning itself with a large bough." Dr. Cobbold comments on the paucity of ectozoa of the elephant, and attributes it to the "rough time" they would have in consequence of this habit. Gilchrist shows that during marching in the heat of the day, the animal should have the head covered with a white padding of wool (one to two inches thick). Forsythe says, the small felted cloth on which the driver sits should be large enough to project and protect the forehead, and the skin of all exposed parts well rubbed with clarified butter (ghee). On the other hand (as Ouchterlony shows), cold is found to very seriously affect elephants. If the animal becomes thoroughly chilled he struggles, shivers, falls, and grows weaker until he dies. It is very difficult to restore the circulation. So he tells us encampments must be on a dry, sheltered spot on the side of a hill, and in marching through a cold country it is advisable to carry a large supply of cordials, such as ardent spirits, in doses of from a pint to a pint and a half, made up into mussalahs, with large quantities of spices formed into chupatties, such as

are generally given to the animal as part of its diet. Rheumatism is very common (Gilchrist), depending on the animal taking to water when hot, also on sudden alternations of temperature. The amount of fibrous tissue in the body would almost *á priori* lead us to anticipate this: "The elephant hath joints, but none for courtesy," says Shakespeare, in allusion to the infrequency of the animal lying down. Though every-day experience in our circuses disproves this saying, yet there are some very interesting facts in connection with the standing posture of this animal. When suffering from severe abdominal pain he rises and lies alternately, (Gilchrist). The elephant, like the camel, is very chicken-hearted when sick and will not attempt to rise, but if made to do so he will remain standing (Ouchterlony). Thus when a sick elephant lies down it is a very bad sign, and it is said that in a state of nature the tushes are used as a means to support by being placed against a tree; and one imprisoned elephant "employed his tusks in making two cavities in the two faces of a stone buttress which projected from the wall of his cell, and these cavities served him for a support when he slept, his tusks being fixed in them"; so runs the account.

The awe and astonishment of the Russian *moujek* recently, when, in the solitary wilds of Siberia, he saw two vast blocks of ice part asunder under the melting influence of the summer sun, and disclose the gigantic body of a mammoth, covered with coarse, reddish-brown hair, and standing as when it met with its death from the severity of a winter, of probably many thousand years ago, would afford a good subject for a picture. No wonder the ignorant peasant fled, and left to the less impressionable wolves the banquet of meat thus preserved by the freezing process which nature bountifully afforded them.

The paucity of limb bones serving to support the immense weight, and their upright arrangement one on the other, account for the persistency in maintaining the standing position, also for the liability of the elephant to fall backwards on ascending mountains when bearing considerable loads, which he is sometimes required to do in the emergencies of service; "whenever they fall under the immense burthen usually placed on their backs they never rise again, even on a good road," says Bernier, who

travelled into Cashmere with Aurunzebe ("Travels in the Mogul Empire"). He also relates a peculiar accident in the following terms: "The king was followed by a long line of elephants, upon which sat ten ladies, in mik-dembers and amaris. The foremost, appalled, as is supposed, by the great length and acclivity of the great path before him, stepped back upon the elephant that was moving in his track; who, again, pushed against the third elephant, the third against the fourth, and so on until fifteen of them, incapable of turning round or extricating themselves in a road so steep and narrow, fell down the precipice." The absence of a ligamentum teres of the hip is an anatomical indication that the elephant is best adapted for movement on level ground and is not fitted for draught purposes. It seems there are some breeds better suited for mountain work than others; notably the small one found in Nepaul. Ouchterlony particularly impresses on us that the head should be up-hill when the animal lies down in camp, otherwise he will be unable to rise without the assistance of two or three other elephants. He will become much distressed, and must be given a stimulant, then pushed on his side to rest himself, and finally pushed on to his legs. In rising he raises the forehand first, and in lying he flexes the fore-limb at the elbow and the hind at the stifle, the fore-foot is turned inwards, with the sole towards the root of the trunk, which organ lies curled upon the ground. Gilchrist remarks that the elephant goes on his hind knees down an incline, on his fore knees up. We also are told that he can climb steep but soft banks of nullahs (or nálás), by so moulding the clay as to form steps for himself, but the authority for this statement is doubtful. It is certain, however, that in crossing boggy places, and to extricate himself from sloughs, he will place bundles of wood or fascines beneath his feet.

(*To be continued*)

Editorial.

THE INSPECTION OF MEAT.

No branch of public hygiene is in a more unsatisfactory condition than that which deals with the supply of flesh as food for the people. Often and over again have we had occasion to point out the dishonest and

dangerous practices of the trade in dealing with unhealthy cattle and diseased meat, and unless the Government or Parliament interfere, we shall probably have to wait for many years before such practices can be checked, or measures devised by which our fellow-creatures may be protected from fraud, or from disease communicated through infected flesh. It is a heavy disgrace to us that many of our large cities, even London itself, are without public slaughter-houses, and that those abominations in every sense of the term—private slaughter-houses—should be permitted to exist. In the majority of instances, they are dens of filth, cruelty, and deception, over which it is impossible to maintain a decent system of inspection or control, and through which—more frequently than is suspected—flesh which should be burned or buried is issued for sale as food.

All slaughter-houses should be public establishments, or at least open to regular inspection; they should be in a proper situation, suitably constructed and fitted, and all animals entering them should be humanely treated, carefully examined before death, and their carcases as carefully scrutinised after slaughter. By these measures alone can the healthy supply of flesh from slaughter-houses be guaranteed. This fact has been long recognised and acted upon by Continental nations, and in this country a small number of large towns has adopted the *abbatoir* system. The other day a society was instituted in London, with the object of collecting subscriptions in order to build a model public slaughter-house, and so, it would seem, to shame the municipal authorities into the course they ought to have taken many years ago.

In connection with the odious system of private slaughter-houses, is the almost equally odious system of meat inspection—indeed, the two systems are very closely related.

The meat inspector would appear to be chosen from among those who are least of all qualified for the duty—being, in fact, anything, in so far as competency is concerned, but a judge of sound and unsound flesh. Often he happens to be a medical man totally unacquainted with the diseases of animals—at least, of those maladies which cause the meat to be unhealthy; sometimes he is a broken-down policeman, shoemaker, butcher, or station-master, whose pretence to know something of the business is all there can be claimed for him.

Under such circumstances, we need not be astonished that very few carcases of bovine, ovine, caprine, or porcine creatures which have succumbed to disease, or which have been killed a few minutes before they would have perished naturally, and which may have been drugged with quantities of medicine before death or the butcher appeared, are buried; on the contrary, our experience goes to prove that their flesh finds its way to the butcher's stall, where it is sold as that of healthy animals. There exists—and no one can gainsay it—a regular trade in such carrion, and the only way to suppress it, next to having all flesh offered for consumption supplied from the abbatoir, is to have a proper system of dead meat inspection carried out by thoroughly competent and trustworthy men.

The necessity for this inspection has been clearly demonstrated by an

occurrence reported from Glasgow towards the end of January last. It appears that in a large dairy near that city, a serious outbreak of Splenic Apoplexy or Anthrax took place, and the carcases of no fewer than sixty-three of the cows were disposed of for human food; many of them were sent into the dead-meat market, which is under the inspectorship of a medical man, and it is quite possible very many more would have been similarly disposed of had not the principal of the veterinary college given notice of the outbreak to the authorities. The malady is, unfortunately, not recognised in the Contagious Diseases (Animals) Act, though it is included in the legislative measures of foreign countries; so that though Professor McCall is the inspector under the Act, yet he was not bound to take any action. His interference is therefore all the more praiseworthy.

The event has caused much sensation in Glasgow, and will possibly ead to more efficient inspection.

It is somewhat of a remarkable coincidence that in Italy a similar occurrence has recently taken place, as we learn from the *Clinica Veterinaria*. A cow died of Anthrax, but the owner wishing to dispose of the carcass, asserted it had perished from suffocation. A medical man gave a certificate that the flesh was fit for food, and it was accordingly disposed of with that object. But very soon afterwards the men who had skinned and cut up the animal, as well as several of those who had partaken of the flesh, were attacked with malignant pustule, and two of them died. The physician was tried by the provincial Sanitary Council, and condemned to be suspended from his function of medical officer of the district, for having been the cause of the people suffering from Anthrax. He appealed against this sentence, and the superior Council of Health which meets at Rome, requested one of their number, Signor Cocconi, Professor of Veterinary Medicine at the University of Bologna, to report on the affair. The reporter, while admitting the good faith on which the medical man acted, yet pointed out that he was not competent to give an opinion on such a matter. These conclusions were unanimously adopted by the Council, who modified the sentence to a reprimand for undertaking a duty for which he was not qualified, and which did not come within his province.

It would be well for the public if the Italian regulations were adopted in this country.

PROTECTIVE INOCULATION FOR ANTHRAX.

On January 26th, Pasteur and his usual assistants, M.M. Chamberland, Roux, and Thuilier, undertook a new series of experiments on Anthrax inoculation in a court of the Hôtel de Ville, at Melun. The experiments were performed in the presence of a large assembly, representing the Minister of Agriculture of France, Agricultural and Veterinary Societies, and many distinguished medical men and Veterinarians from various parts. The object of the experiments was to ascertain the duration of the immunity conferred by protective inoculation, or "vaccination," as it has been improperly termed. They were carried out on four lots of sheep placed at the service of Pasteur by the Melun Agricultural Society.

The *first* lot comprised *seven* animals. Six of these had served at the memorable experiments at Pouilly-le-Fort (see Journal for January, p. 26), *i.e.*, they had been inoculated on the 5th and 17th of May, 1881, with the cultivated or prepared virus, and again inoculated on 31st May with very virulent virus, and were unaffected; the *seventh* was a lamb six months old, dropped from a ewe "vaccinated" and inoculated at Pouilly-le-Fort.

The *second* lot was composed of six sheep inoculated on the 7th and 21st July, 1881, and among them were two lambs, which were seven days old when first inoculated.

The *third* lot was also composed of six sheep which had been inoculated at the same time as the last lot.

The *fourth* lot included four sheep which had not been protected by inoculation, and Pasteur predicted they would perish.

The animals of the different lots were distinguished by collars of different colours; those of the first being red, of the second white, of the third yellow, and of the fourth black.

The *twenty-three* animals, on January 26th, received at the inner side of the right thigh an injection of very virulent virus, after which they were conveyed in a carriage to Pouilly-le-Fort. On the next day (27th) two of the non-protected (black collars) were ill. On the 28th these were still worse, and two others with black collars were also unwell, and refused all food. All the others were apparently quite healthy, and there was nothing whatever about them to lead any one to suppose that they had been submitted to the terrible test of the most virulent Anthrax inoculation.

On the 29th January, in the morning, the two sheep which were seized with illness on the 27th, were found dead. At nine o'clock in the morning of the same day, the lamb which had not been protectively inoculated, but which had been born from a ewe that had been protectively and virulently inoculated, died. Its body was examined by M. Rossignol, Veterinary Surgeon of Melun, and the appearances were as follows:—The intestinal lesions were not marked; the spleen was a little larger than in health; there was *vast* œdema of the inoculated thigh, the infiltration of the connective tissue extending into the deepest interstices of the muscles, and the infiltrate being of a beautiful citron tint, while the muscles of the thigh were discoloured and softened, with here and there patches of ecchymoses.

The other two sick sheep had a temperature of 107.6° and 108.5°. In three other sheep of the protected lots, the thermometer also indicated a rise of temperature, but which did not exceed 104°.

On the morning of January 30th, the black-collared sheep whose temperature was 108.5° the previous evening, was found dead. The other sick one—the last of the non-protected animals—was very ill; its temperature was still 107.6°, but there was nothing to indicate that it would succumb on that day. All the other sheep were in excellent health, and had a good appetite.

On January 31st the sick sheep was found dead in the morning. The sanitary condition of the other protectively inoculated animals was perfectly satisfactory, and sufficiently proved that they had successfully withstood the test. On February 1st, some temperatures taken at random among them showed that they were well—the thermometer not recording higher than 101.2°, 101°, 102°, and 102.2°.

This most satisfactory experiment is a new triumph for Pasteur, even more demonstrative than the others he had obtained. It assures us that the immunity conferred by protective inoculation lasts for at any rate seven months, and it may be presumed that it is certain for at least a year.

The death of the lamb seems to prove that the protected mother does not transmit to her progeny the immunity conferred upon her; though one experiment only does not authorize a definite conclusion in this respect.

The five dead animals were buried at the place where the others that had perished in the same manner in May last had been interred. These interments are intended to prove that the ground may become infected with the contagium of Splenic Apoplexy ; the experiments demonstrating this are to take place in June of this year. At the same time, experiments will also be again made on animals protectively inoculated for more than a year, by re-inoculating them with very virulent material. From the success which has already attended these protective inoculations, no doubt need be entertained that those in June will be equally satisfactory.

THE EPIZOÖTY (DISTOMATOSIS) AMONG CRAYFISH IN CENTRAL EUROPE.*

THERE can be but few persons who have not heard of the terrible epizoöty which, like a plague, has led to the disappearance, in less than four or five years, of all the crayfish from half the rivers of Central Europe. This crustacean—so highly esteemed and sought for—is now little more than a *souvenir* in the vast extent of country stretching from the Meuse and Saône to the Danube and the Oder. Everything seems to indicate that this terrible plague commenced in Alsace ; at least, if writers upon it are consulted, it will be found that it was in that region the first cry of alarm was heard. It is stated that from June, 1878, the crayfish diminished rapidly in numbers in the various watercourses in Upper as well as Lower Alsace, and especially in the Ill, a river which, running from south to north, traverses nearly all the plains in the country, and the crayfish of which were particularly celebrated for their quantity as well as quality. Not only did these creatures vanish from the majority of the rivers and streams, but those which were kept in dams or fishing reservoirs died also in a very short time. From 1879, in the Council General of Lower Lorraine, were echoed the complaints of the public, and particularly the fishermen. On the motion of M. Hack, Director of the Pisciculture of Huningue, it was ordained that crayfish were not to be caught for three years, and a sum of money was voted to procure the re-stocking of watercourses with crayfish from non-infected countries. But nearly at the same time—in 1878—this plague was reported in nearly every country adjoining Alsace-Lorraine, notably in Switzerland, in the affluents of the Birse and the Aar ; and in France, in the Doubs, Saône, Meuse, and Moselle.

In Belgium there was equal complaint of the great mortality that had prevailed among the crayfish for some years—a mortality which was due, according to some reports, to modifications in the composition of the water, and to others to the presence of a parasite in these crustaceans.

With regard to the Grand Duchy of Luxembourg, we learn that for two or three years the crayfish had completely and suddenly disappeared from the Moselle, and that from this time the disease was propagated among the crustaceans in the affluents of that river, as well as amongst those of the Sûre ; in fact, the crayfish had disappeared from the whole of Luxembourg, as far as the foot of the Ardennes. All the water-courses of that part of the Grand Duchy known as "le bon pays" are to-day entirely destitute of this crustacean, which was once so abundant, and it is only to be found in the rivulets of the Ardennes. The seasons did not appear to have any influence on its disappearance.

* This is a translation of a paper by A. Zundel, Honorary Associate of the R.C.V.S., and Superior Veterinary Surgeon of Alsace-Lorraine, which was published in the Bulletin of the Académie Royale de Médecine de Belgique, 3rd series, vol. xv., No. 9.

In Germany the disease was observed in nearly all the watercourses in the Duchies of Baden, Wurtemburg, and Bavaria, where the malady had penetrated in one direction into Lower Austria—Carinthia and Styria, in the other into Saxony and the greater part of Prussia. As these lines are being written it is announced that the scourge has appeared in Pomerania, where it had not been seen before the thawing of the water-courses.

According to Dr. Micha,* the Crayfish Plague must have prevailed since 1874 in the province of Magdebourg, and especially in the Spree, near Furstenwalde. It appears to have also been present for some time in Sweden. As it is at the present time (spring of 1881), it is easier to enumerate the countries which it has not attacked than those in which it is prevalent. Those yet free from it are, for Central Europe, in Germany—East and West Prussia, Posen and Silesia; in Austria—Bohemia, Moravia, Hungary, Galicia, Transylvania, Carniola, Croatia, and the Tyrol. Up to the present time it has not been seen in Italy, the west of France, nor in the basin of the Seine.

The great extent of territory over which the Crayfish Plague has shown itself, and the very short time it has required to travel through the whole of Central Europe, are proofs of its rapid progress and extreme gravity. With a rapidity of propagation and a mortality greater than any plagues which have hitherto attacked mankind or animals, this crayfish epizoöty has occasioned disasters of which it is difficult to form an idea. M. Küffer, a great fish-breeder at Munich, has seen 25,000 perish in less than four weeks, and on another occasion more than 6,000 in fifteen days;† while M. Washington, of Pols, Austria, has lost more than 3,000 in a day in only one of his ponds.‡

The disease always extends by ascending the water-courses. In Alsace it ascended the Ill towards its different affluents from the Vosges, and where, for some time, it was only seen in those parts of the valleys where the current was not rapid; whence it appears to have penetrated high up these valleys into the mountain rivulets, which used to be so thickly populated with crayfish. From one season to another, the already small zone in which healthy crayfish were to be found has become more contracted. Those imported from a distance to repopulate the water-courses appear also to have become victims of the epizoöty; and now this delicate crustacean is a product altogether absent from our rivers, and is scarcely ever seen in our markets.

The damage occasioned by the disease is incalculable. The losses sustained by the fishermen and tradespeople reach hundreds of thousands of francs; while the former and the piscicultivators have lost a lucrative branch of their industry, and the hotel-keepers are deprived of the pleasure of offering to their patrons one of the most esteemed danties.

Before closing this brief historical sketch of the Crayfish Plague, the important question presents itself for solution with regard to whether this murderous disease is really a new one. We are almost compelled to believe it is; for it could scarcely happen that it would be present without being reported, even though the trade in these creatures in former times was insignificant in comparison with what it has been in recent days. There is no trace of it in the writings of the older physicians: though Guersent, Ozanam, and Heusinger, in their histories of contagious diseases, mention epizoöties among fish, yet they do not mention crayfish. De Baer, who, in 1827, cites the *Distoma cirrigerum* of the muscles of crayfish, and who sometimes found two hundred of these parasites in one of these crustacea,

* "Deutsche Fischerzeitung," 1881, p. 353.
† "Jahresbericht der Thierarzneischule zu München," 1880, p. 74.
‡ *Ibid*, p. 76.

does not attribute any great mortality to them.* De Trebold, who has observed the same distoma of crayfish in 1835, does not consider it produces serious disease.† It is true that at that time the noxious and pathogenic influences of helminths were not so well understood as nowadays; indeed, they were not only looked upon as relatively innocuous, but their effects were believed to be useful and hygienic. Nevertheless it is to this distoma (*Distoma cirrigerum*) that, according to the interesting researches of Dr. Harz, Professor at the Munich Veterinary School, the Plague of Crayfish must be attributed.‡ Professor Unterberger, of the Veterinary School at Dorpat, Russia, is the only author who mentions an epizoöty among crayfish, and which he observed in the rivers and canals that have their embouchure in the Neva, and which reunite in the lakes of Ladoga, Onega, Biela, etc.; but he attributed it to Anthrax, or the Siberian Plague (*Jaswa*), due to the custom of throwing the bodies of animals which have died of that disease into these rivers and canals.§ The various authorities on pisciculture also completely ignore it when alluding to the diseases of crayfish; and it is only in recent years that a few *savans* have occupied themselves with the plague now under consideration. We may particularly cite, without specially indicating their opinions, Hack, of Huningue ;‖ Haldenwang, of Baden-Baden ;¶ Rueff, of Stuttgart ;** Hallier, of Jena ;†† Bollinger, of Munich ;‡‡ but in an especial manner Harz, of Munich,§§ to whom we owe the principal information that has enabled us to undertake this little treatise.

We must be necessarily brief with regard to the symptoms of this disease, the ultimate effects, great mortality and losses from which are better known than the consequences of the pathological phenomena. One of the first signs of an invasion of the disease is the crayfish crawling along with rigid limbs, and not attempting to escape when about to be captured; they no longer struggle when caught; and so far from seeking the corners and crevices in the reservoirs, they remain apart from them, appear indisposed to needless movements, and to dread touching each other. For this reason, evidently, they congregate involuntarily in groups in the middle of the ponds, where they look like inert masses. When turned on their back they have not sufficient strength to recover themselves; and in a stream they allow themselves to be carried away by the current, without offering the slightest resistance. Usually they do not quarrel among themselves, except, perhaps, at the period of "rutting," but when attacked by the plague they are very irritable, and frequently aggressive—seizing each other fiercely and convulsively in their claws, but without being able to release themselves afterwards; so that when locked together in this way they oftentimes tear off each other's limbs—separation only occurring through the loss of a claw or leg. This fact explains why, from the commencement of the epizoöty, a characteristic indication of its existence is the number of claws and limbs always found at the bottom of the ponds or beds of streams. The loss of these parts is not brought about by dry gangrene, analogous to that taking place in ergotism, as Harz has observed that the diseased crayfish, when kept separate until they die, do not have their limbs detached in this way.

There is also a certain amount of tumefaction of the abdomen—the part

* "Nov. Act. Acad." C.L.C.G. Nat. Curiosior. XII. ii., p. 553.

† Wiegmann's "Archiv." Band i. 64.

‡ "Jahresbericht der Thierarzneischule zu München," 1880: "Beitrage zur Kenntniss der Krebspest." "Deutsche Zeitschrift für Thiermedicin," Band vii., 1881: Ein Distomatosis der Fusskretsen."

§ "Renelt. der Siberische Milzbrand," 1863.

‖ "Verwaltungs Bericht von Nater Elsan," 1879, p. 228.

¶ "Deutsche Fischerzeitung," 1879. ** "Schwäbischer Merkur," 1879, April 18th.

†† "Revue für Thierheilkunde," 1880. ‡‡ "Aerztlicher Intelligenzblatt," 1880.

§§ *Loco citato.*

improperly called the tail—and especially around the anus, all this region becoming reddish-tinted, and even translucid.

At a more advanced stage of the disease, the crayfish lose their sensibility, and at the same time their irritability: their eyes—which are very prominent, as if their muscles were attacked with paresis—may be touched with the finger without the creatures seeking to withdraw themselves. They rarely change their position, and only now and again manifest slight movements, accompanied by spasmodic contractions. If one is taken in the hand convulsive movements occur, but they are not the strong and sudden movements, accompanied by the clicking sound of the tail, which are noted in the healthy crayfish whose muscular power is not impaired. The muscular contractions in the diseased creature evidently occasion pain, or are produced by it. The ordinary movements of the limbs are slow, and often disordered; the claws can no longer pinch; and the rudimentary "toes," which alone are shed, are wide apart from the body.

The disease insensibly increases, and death—which soon takes place—is preceded by a spasmodic dilatation of the anus, from which escapes a quantity of fluid, mixed with mucus. The disease is of brief continuance—eight days at most, sometimes scarcely three days. It is always incurable, and is generally fatal.

The malady has often been attributed by fishermen to the presence in streams of an aquatic plant imported from Canada about 1847, the *Elodea Canadensis*, which has propagated itself with such rapidity in the rivers and canals of Europe that it often prevents fishing, and even offers an obstacle to navigation: for this reason it has been designated the "water plague" (*peste des eaux*).

According to Harz, this Crayfish Plague is essentially infectious, but not contagious, *i.e.*, it is not communicated by simple cohabitation. If healthy crayfish are put into a basin where there are diseased ones, or *vice versâ*, the latter will die in a short time, while the former will remain sound. The disease is not due, in fact, to microscopic germs which, as in anthracoid or typhoid affections, are detached from the sick, and fix themselves in a new subject, which they infect. It is due to a more complex organism—to a helminth, properly so called, which is not propagated directly from one crayfish to another, but must previously pass through another host, develop on or in another species of animal, in virtue of Steenstrup's law of alternate generation. The disease, according to the interesting discovery of Harz, is due to a distoma, and he has described it under the name of "Crayfish Distomatosis" (*Distomatosis astacina*).*

At the autopsy of diseased crayfish, there is always found an alteration in the muscular tissue, which is without consistence, reddish, and looking as if decomposing. As in all typhoid affections, when examined by means of the microscope its fibres have lost their transverse striæ. Harz has always met with, sometimes in a free state, sometimes encysted in the manner of trichinæ, the trematode described by Baer under the name of *Distoma cirrigerum*, and which that observer discovered in 1827 in the muscles of crayfish, and which Siebold also described some years later. Sometimes there is also found in the diseased crayfish the *Distoma isostomum*, described by Rudolphi. The presence of these parasites in the muscular tissue explains the violent pain evidently experienced by the crayfish—pain which would seem to be induced by the migration of the parasites, and by the loss of substance and compression of the tissues they give rise to; this also explains the difficulty in movement. Their number is very variable, there sometimes being only from three to five; but most frequently there are from twenty to fifty, and at times even 160 to 200.

* "Deutsche Zeitschrift für Thiermedicin und Viehzucht," 1881.

The *Distoma cirrigerum* is the most common. In a free state it looks like an elongated sac, with a mouth at the upper extremity and a lateral sucker on each side at the superior third of the body, these suckers being bordered by a wide fringe (cirrus), to which the creature owes its name. The creature measures 1·20 millimètre in length, and 0·25 millimètre in width. The cyst is formed by the sarcolemma; it is hyaloid, remains soft and elastic, and has no particular structure. The distoma lies doubled on itself in such a way that when encysted it is smaller than when free, and consequently occupies less space. The cyst is round, or slightly elongated in shape, and measures 0·75 millimètre in length and 0·50 millimètre in width.

The encysted distoma are more particularly found in the muscles of the tail, claws, feet, mandibles, and antennæ. They are not exclusively lodged in this muscular tissue, but are found in the walls of the intestines, stomach, heart, and even the generative organs, though never in the branchiæ or liver. The free parasites usually occupy the connective tissue of organs, and are not infrequently found in the splanchnic cavity.

The intestines of diseased crayfish are pale and empty—containing only numerous organic granules, micrococci, and sometimes leptothrical chains and bacteria, which indicate a dysenteric condition. There is ordinarily nothing abnormal with regard to the heart, blood-vessels, liver, genital organs, or branchiæ.

The disease is not due to microscopic fungi, bacteria, or microbia, as some observers—such as Hack, Hallier, Bollinger—at one time believed. These organisms are certainly sometimes found in diseased crayfish, but not constantly. It is the same with the *Branchiobdella*, parasitic annelides found in the branchiæ of the crayfish, and brought to notice some time ago by Roesel, studied by Odier,* and supposed to be the cause of the disease by Ruef and Hilzendorf. These various parasites may produce other maladies in crayfish, but not this particular plague; indeed, they are ordinarily the cause of the mortality almost constantly observed in the ponds of crayfish dealers, and which at times carries off fifteen to twenty-five per cent. The sole cause of the Crayfish Plague is the distoma, which is never absent in those attacked by the disease (Harz).

It is not very difficult to ascertain the presence of the parasites. We have found them by microscopical examination for more than a year without being able to make out exactly their nature. We have taken an almost dead crayfish, torn off the tail, separated the rings, and so exposed the muscles of this part and the whole of the abdomen. This tissue has been teased out, and the juice from it placed on a glass slide under the microscope, and there were then perceived a considerable number of more or less elongated objects, which were rolling themselves up, stretching out, describing half-circles, and twisting like serpents. We believed we had discovered some cercariæ, some larvæ of the distoma—something analogous to the cercariæ obtained, according to the directions of Van Beneden, in teasing out under the microscope any fresh-water molluscs, such as the *Limnacæ* or *Planorbicæ* of marshes; we also saw a multitude of that kind of tadpole which moves about actively. But various circumstances—such as the difficulty of procuring diseased crayfish, more pressing occupations, etc.—prevented our pursuing the discovery, and we had to be content to communicate what we had done to the authorities of the Strasbourg district, in a report as to the prevalence of the plague therein. It was not until reading, a little time ago, the interesting researches of Harz, and comparing his discovery with our own, that we recognized we had before us the distoma of De Baer. Harz states, in fact, that if the distoma is extracted from its shell, and slightly

* *Guérin*, "Dictionnaire d'Histoire Naturelle," tome ii, p. 636.

compressed on the slide under the microscope, we shall see it twisting about in every direction, changing its form, elongating, contracting, etc.

The distoma I have obtained from diseased crayfish differs from those mentioned by Harz, in being a little longer and not always provided with a caudal appendix; being a degree less advanced in development than those figured by him, and therefore representing veritable cercariæ.

The distoma of De Baer, which Harz has found so frequently in the Crayfish Plague that he does not hesitate to attribute this grave malady to it, is nevertheless not a perfect creature, and is not to be compared with the *Distoma hepatica* of ruminants. It has only rudimentary generative organs, does not produce eggs, and cannot propagate in the crayfish. There is, accordingly, every reason to compare this agamous creature with the cercariæ of molluscs; for, like these, and also the cercariæ of other crustaceans, or even of worms, it is essential that the distoma of the crayfish be ingested by a higher species of animal—a vertebrate—in order to become a perfect creature and propagate by ova.

It is, therefore, important to know the animal in which the distoma attains its perfect condition. It is probably a fish—but what fish? The number of distomata is very great, and they inhabit, with few exceptions, all classes of the animal kingdom: they are particularly numerous in fishes. Harz thinks it is probably in a cyprin, especially in the carp or tench, that the perfect distoma of the crayfish is to be found: perhaps it is in the eel, as appears to be proved by the observations made in Sweden, and reported to Harz by Dr. Linroth.*

The bed of the Klar-elfen was at one time very rich in fine crayfish. This river, flowing into lake Menern, and forming the cataract of Torollhatten, falls into the sea some miles beyond that point. Fish coming from the sea can only pass as far as the cataract, and amongst these are many eels.

Some years ago there was a canal made which went round the fall, and utilized its water. Since that time the eels and other fishes have found their way into the lake, and pass into the Klar-elfen, and the crayfish previously there have coincidently disappeared from that river, as well as those subsequently introduced.

Eels may readily swallow the crayfish at the period of moulting, when their shell is soft. If one eel only swallows a single diseased crayfish, this may lodge, on an average, fifty distoma, and the fish may consequently soon become the involuntary host of all those perfect entozoa, which, being hermaphrodites, will not be long before they expel a considerable number of ova. Without admitting that these distoma are as prolific as the *Distoma lanceolatum* of the sheep's liver, and which produces more than a million of eggs, the distoma swallowed by the fish may nevertheless throw off a considerable number of ova, which may in their turn be swallowed by the crayfish, or rather produce embryos which may be so ingested, either directly or after undergoing some metamorphosis; the embryos hatched from the eggs being transformed into imperfect distoma, the cause of the disease. Perhaps there is between the fish and the crayfish another intermediate bearer—some mollusc in which the embryo is a sporocyst before it becomes a cercaria: this triple host, which exists for so many distoma, may very possibly be also necessary for that of the crayfish.

In the meanwhile, we may even admit that the crayfish is only infected when it swallows the eggs of its distoma, which becomes perfect in the body of some fish. These ova, in all probability, are thrown out in the intestine of the fish, and, like those of other distoma, are expelled with the fæces.

* Harz has since discovered that this entozoon develops in the bodies of birds, and particularly in swallows.

From these, as yet very incomplete, details we may nevertheless draw three important practical conclusions :—

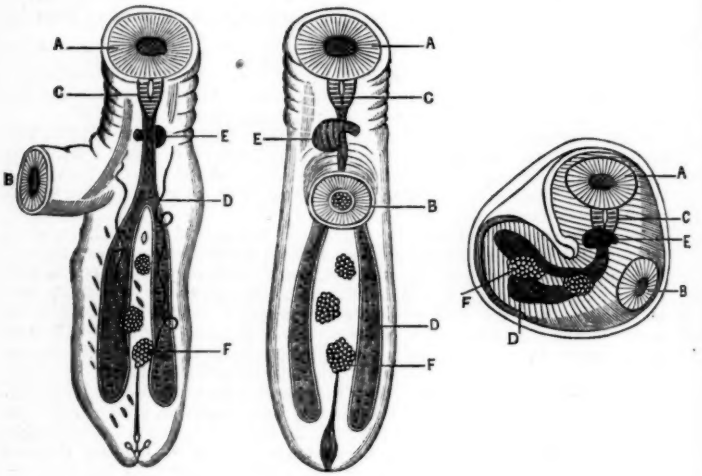
1. It is a bad practice to give crayfish the viscera or dead bodies of fish to eat, without at least cooking them well : much better feed them on flesh, liver, or even grains.

2. For the same reason it is wrong to keep fish in the same streams or ponds with crayfish.

3. Crayfish intended to replenish the streams and ponds where the disease has prevailed should be kept for a year at least in a reservoir where there are no fish, as during that time the germs which may have got into a water containing no crayfish will have perished.

In conclusion, it may be stated that all attempts to treat this distomatosis have proved unsuccessful. Salt water and carbolized water kill the crayfish quicker than their parasites. Experiments have, however, demonstrated that crayfish live for some hours in water containing one part of permanganate of potass to 10,000 of that fluid ; and if this agent has no effect on the distoma, it might at least serve to free them from external parasites, especially those which exist on the branchiæ.

Fig. 1. Fig. 2. Fig. 3.



DESCRIPTION OF THE FIGURES.

Fig. 1. Lateral view of the free *Distoma cirrigerum*, magnified 300 diameters.

Fig. 2. Anterior view.

Fig. 3. Encysted parasite.

A A A, Terminal and nutrition sucker. B B B, Lateral and locomotory sucker. C C C, Pharynx. D D D, Digestive tube divided into two sacs. E E E, Rudimentary testicle. F F F, Rudimentary ovaries.

A NEW VETERINARY JOURNAL.

WE have received the first number of THE AUSTRALIAN VETERINARY JOURNAL, and heartily welcome our Antipodean namesake. Published monthly, and edited by such able and zealous members of the profession as Graham Mitchell, Thomas Chalwin, and William T. Kendall, it will afford an excellent means of developing veterinary medicine for the benefit of our Australian and other colonies in that region, while improving the position of its practitioners. The Journal contains a number of well-written and interesting articles, one in particular, by Mr. Kendall, on Ossific Diseases in Australian Horses, is worthy of notice.

We wish our contemporary a prosperous career.

THE NEW REGISTER OF VETERINARY SURGEONS.

THE Register for the current year has now been issued, and as it has been re-arranged, modified, and corrected in conformity with the Act of Parliament, and the new position of the profession, it appears in a very different form to that it presented in previous years, and one more befitting the conditions in which veterinary surgeons are for the present and future placed. Perhaps nothing could better indicate the progress that has been made than this new Register. The price is two shillings, post free.

Proceedings of Veterinary Medical Societies, &c.

IRISH CENTRAL VETERINARY MEDICAL SOCIETY.

THE first regular meeting of this Society was held on the 30th Jan. at the Hibernian Hotel, Dawson Street, Dublin; T. D. Lambert, Esq., F.R.C.V.S., President, in the chair.

The following members attended:—Messrs. T. H. Simcocks (Vice-President), Drogheda; W. C. Joseph; J. Freeman; H. Ashbee; M. Hedley; J. J. Sperring (Hon. Sec.); R. H. Bird; G. B. Miller; F. T. Welham; A. J. Kelly; J. Malcolm (Vice-President), Enniscorthy; L. Hunter; A. J. Ross, A.V.D. (Vice-President); S. L. Pallin, 18th Hussars; and T. H. Prior, Parsonstown. Letters of apology were read from several members for non-attendance.

The Secretary read the minutes of the previous meeting, which were confirmed, and the following new members were unanimously elected, viz, Messrs. J. Preston, F.R.C.V.S., Mallow; S. Adamson, Government Veterinary Inspector, Greenore; John Bell, M.R.C.V.S., Clonmel; and Herbert Sewell, Inspecting Veterinary Surgeon, A.V.D.

A letter was read from Geo. Fleming, Esq., President of the R.C.V.S., acknowledging with thanks his election as an Honorary Associate of the Society. It was ordered to be inserted on the minutes.

The PRESIDENT then proceeded to read his inaugural address, as follows:—

"I rise with pleasure to inaugurate the Irish Central Veterinary Medical Society. You have honoured me with your first and best gift in selecting me as your President, and sincerely do I feel the compliment paid me, and it will be my earnest endeavour to be deserving of it. It therefore becomes my duty to address you this evening; and casting about for a subject, I think I can best serve the interests of this Society by giving you a short

retrospective view of our career as veterinarians of the past, and also the hopes we entertain for the future.

Eminent Irish Veterinarians.

We in Ireland can with pride look back to the honourable names of Professor Peel and George Watts—names held in renown as having been the first to make their mark in this country, and as men who thoroughly understood their profession, and succeeded in gaining the respect of all who knew them. After them came other celebrated veterinarians—Johnson and Farrall. I had the pleasure of Mr. Farrall's acquaintance, having been his assistant for some years, and it gives me great pleasure to state that he was an ornament to his profession—a man of fine physique, having a good address, and a thoroughly practical veterinary surgeon; and I sincerely regret that he was taken away in the prime of life. Coming to the present generation, I may mention the name of Professor Ferguson, and I am sure you will all agree with me that he has done a great deal of good for this country. Having been appointed professional adviser to the Privy Council, he succeeded in quickly stamping out that dreaded cattle disease, "Rinderpest," when it made its appearance in Ireland. He has also effectually stamped out Foot-and-mouth Disease, and been able not only to keep in check, but greatly to reduce the number of cases of Lung Distemper in cattle. I think, therefore, that the names just mentioned will compare favourably with any in the United Kingdom, and I hope that our profession may continue to send forth such shining lights.

Veterinary Medical Societies.

I beg to allude to the success of veterinary medical societies in England and Scotland, the old ones going on famously, and new ones springing up in various districts; and recently there was one founded in the north of Scotland. Let us, therefore, hope that the Irish Central will soon rival them all, as the day has gone by when the lights of science were despised, and veterinary science is essentially a matter of political economy, and the field for its exercise is literally unbounded.

The Veterinary Surgeons Bill.

The profession of veterinary surgery has long been subjected to gross injustice, and I may here make a passing allusion to one who has worked hard in promoting the Veterinary Surgeons Bill, which has recently passed through Parliament. Mr. Simcocks, of Drogheda, I need scarcely say, deserves our best thanks for his valuable assistance. To Mr. George Fleming, the brilliant President of the Royal College of Veterinary Surgeons, and also to the English and Scotch veterinary medical societies, we owe a deep debt of gratitude. I am glad to say that our late Lord Lieutenant, Earl Spencer, the present Lord President of the Privy Council, "a man who loves horses and animals generally," and who has their welfare at heart, "as well as that of the veterinary profession," was a supporter of the Bill. The numerous Government appointments under the Contagious Diseases (Animals) Act have been a great boon to our profession, as well as to the public, and I hope soon to see none but qualified men employed by either the Government or the several local authorities in Ireland. I have no doubt that when veterinary students are better taught the practical parts of their profession, the authorities will not recognize quackery.

Education of Veterinarians.

My views on the subject of educating the young veterinarian are—first, that he should go to college for twelve months, after that remain with a veteri-

nary surgeon in extensive practice for two years, then complete his studies at the college, and obtain his diploma. It is also necessary that he should study the principles and practice of horse-shoeing, as the vast majority of lamenesses are directly and solely referable to functional derangement from bad shoeing, and any one ignorant of it cannot hope to successfully treat the injuries and diseases to which the foot of the horse is liable. I say this advisedly, having found the benefits of it in practice. I am satisfied that the foregoing is the proper way to make a thoroughly practical veterinary surgeon, and when he has to face the public he will not disgrace himself by committing blunders through the want of practical experience. When the student has made himself acquainted with what is known by the most experienced writers he must prepare to undertake the more difficult task of observing and reflecting for himself, watch cases attentively, and take notes of their important particulars; and when he comes to see diseases on a large scale he will naturally be led to compare what he sees in nature with the way in which they are represented in books; and in doing so it will occur to him that many of them are defective in their representation, and, no matter how attentively and thoughtfully he reads, it will be impossible for him to gain anything but partial and confused notions.

About twelve years ago the late Serjeant Heron, in cross-examining me in a horse case, asked me whether I recognized a book called "Youatt on the Horse." I said "No," and he seemed astonished, and said, "Might I ask you, sir, why you do not?" My answer was, that we have not a single book on veterinary practice worth reading. Since that time, however, veterinary literature has made rapid strides, and I can refer with pleasure to the works of Fleming and Professor Williams, as they are, with few exceptions (which, no doubt, will be revised in later editions), a credit to their authors, and ought to be in the library of every member of the veterinary profession. Unfortunately, the veterinarian has much to contend with, having to come in contact with unprincipled horse-dealers of various descriptions; but he should start in life with a determination to avoid dishonest horse jobbery and imposition, and although the system may not pay at first, it must tell and be profitable in the long run. I, however, must here remark that there are some persons who deal in horses that are as straightforward and honourable men as can be met with in any trade or situation in life.

The Proposed Veterinary College in Ireland.

I now come to a matter of which much has been said and agitated about —I allude to the establishment of a veterinary college in Ireland. Similar institutions live and flourish in the sister country—their influence for good has been acknowledged and felt; and will anyone tell me that there is no material for one here? But, in my humble opinion, such a college should be educational, and not diploma-giving, as *Vis unita fortior* is the motto of our profession, and there should be but one licensing body in the United Kingdom of Ireland and Great Britain, who can have no objection, at stated annual periods, to send over its examiners to test the merits of those who have been thoroughly educated in Ireland alone, and are thereby satisfied to undergo the ordeal. The central licensing body will gladly give each of the successful candidates a diploma.

Status of the Veterinarian.

Hardly any of us, qualified veterinary surgeons, whose educational attainments are even passable, and whose conduct in life is respectable, has any

one but himself to blame if he be not held in the high estimation a professional man ought to be. When we look back to days gone by, and then reflect them in what is passing under our notice at the present day, and think of what public opinion is in regard to us as veterinarians, we must be struck in our minds with the surprising changes that have taken place; and furthermore, we know that it is only by observing and recording facts that we can hope to improve ourselves or the condition of those animals committed to our care. The day has far gone when the lights of science were despised, and when men gloried in being ignorant, under the false plea of being practical. The veterinarians of the present day have, therefore, reason to be proud of their superiority of power to eradicate disease and remove lameness. I notice that the status of veterinary surgeons is improving very much, and all over Great Britain they are called upon to hold very important positions, and a better class of men are enlisting themselves into its ranks. Then let us all try to uphold the position that we have now attained, and at our Society's meetings discuss every subject that is brought before us, and be ready to accept knowledge from wheresoever proffered; and each of us will, by that means, have the opportunity of comparing the results of his labours with those obtained elsewhere. And in our progress let us hope to increase the diffusion of sound and useful learning on all matters relating to the health and diseases of animals.

In conclusion, gentlemen, I sincerely hope that the members will attend the meetings regularly, and second our united efforts to promote the highest interests of the profession, work harmoniously together, and try to bring our Society to the front. We all know that great and good works advance slowly, and we can be no exception to the general rule; but of this I am confident, that if the profession be only true to its own interests it will continue to grow in sound learning and utility, rapidly rise in public esteem, and more and more consolidate itself amongst the callings of honourable and useful public members of society in general."

The question was raised by Mr. HEDLEY that it was derogatory to the dignity of veterinary societies in general to hold their meetings at hotels, and he proposed that the meetings of the "Irish Central" be held elsewhere, in some room to be provided for the purpose. The proposition was seconded by Mr. ROSS, A.V.D., but on its being put to the vote the resolution was lost by a majority of fifteen to two.

The PRESIDENT announced that at the next meeting, which will be held on the 20th April, at the Hibernian Hotel, Dublin, Mr. Ross, A.V.D., will read a paper on "Melanosis," and said that he was sure it would be a most interesting one, from the fact of Mr. Ross having had such an exceptionally wide field of observation of the disease in question during nearly twenty years' service with the Scots Greys.

The SECRETARY said that he had much pleasure in stating that the Society was starting on its course with a subscribing roll of thirty members, an announcement which was received with much satisfaction by the members present.

A number of the members then supped together, and, after the usual toasts, the proceedings of the remainder of the evening were enlivened by several musical items, in which the President, Secretary, Mr. Freeman, Mr. Miller, Mr. Malcolm, and others took part, and the company separated with mutual good wishes for the advancement and prosperity of the Irish Central Veterinary Medical Society.

J. J. SPERRING, M.R.C.V.S.,
Hon. Sec. and Treasurer.

SCOTTISH METROPOLITAN VETERINARY MEDICAL SOCIETY.

THE annual meeting of this Society was held in the London Hotel, Edinburgh, on Wednesday, Feb. 8th.

Present: Professors Williams, Walley, Baird, McFadyean, McQueen, and Lewis; Messrs. Borthwick, Kirkliston; Aitken, Sen. and Jun., Edinburgh; Aitken, Jun., Dalkeith; Cunningham, Slateford; Reid, Leith; Dalling and Mitchell, Bathgate; Boyd, Melrose; Connachie, Selkirk; Black, Howgate; Young, East Calder; Kirk, Grey, Fairbairn, and W. O. Williams, Edinburgh; Bryce, Stirling; Cameron, Berwick-on-Tweed; Campbell, Kirkcudbright; Lindsay, Alloa; Pottie, Paisley; Anderson, Hill, Weir, and other gentlemen from the west; C. Philips, Esq., A.V.D., 3rd Dragoon Guards, Piershill; Capt. Hayes, New Veterinary College; Mr. Spreull, Dundee; a few friends, the representatives of the press, a large number of students from both Colleges, and the Secretary.

The retiring President took the chair until the minutes of last meeting were read and confirmed, which being done, he, with a few appropriate remarks, vacated it in favour of C. Cunningham, Esq., Slateford, President for the current year.

The following gentlemen, proposed by the Secretary and seconded by Prof. Baird, were elected members:—Prof. Lewis, New Veterinary College; Mr. Constable, Inchture; Mr. Bryce, Stirling; Mr. A. Grey, and Mr. Fairbairn, Clyde Street Veterinary College.

The following gentlemen, were by the Secretary nominated for membership:—Mr. W. O. Williams, New Veterinary College; Mr. Lindsay, Alloa; Mr. Aitken, Jun., Dalkeith; Mr. Fingzies, Lochgelly; and Mr. Cameron, Berwick-on-Tweed.

Letters regretting inability to be present were announced from a large number of gentlemen.

The SECRETARY read a letter from Mr. Martin, of the Southern Counties Veterinary Medical Association, to the effect that, in view of the services rendered by Mr. Fleming "in procuring an Act of Parliament for the protection of the qualified members of the profession, a testimonial be presented him, as an earnest evidence of our recognition and appreciation of his service," and desiring to know the feeling of the members of this Society in the matter.

Prof. WALLEY thought the feeling of Mr. Fleming himself should first be ascertained, which was concurred in by Prof. Baird. The SECRETARY, however, while pointing out that the subject was one entirely for the consideration of each individual member, strongly advocated Mr. Fleming's work in this special instance being specially recognized by the profession, without referring the matter to Mr. Fleming himself. In this the Secretary was supported by Mr. SPREULL of Dundee, Mr. POTTIE of Paisley, and by the PRESIDENT.

Finally the matter was placed before the meeting in the form of a motion, by Prof. WALLEY, "That the members, before doing anything, first learn whether or not Mr. Fleming will accept any testimonial;" and an amendment by the SECRETARY "That the meeting entirely approves of the proposition set forth in the letter read." The motion and the amendment, being seconded, were put to the vote, with the result of neither being confirmed, and the subject dropped.

Capt. HAYES, New Veterinary College, Edinburgh, read an interesting paper on the "Feeding of Horses," as follows:—Although I may not have, in the brief time at my disposal, anything entirely new to offer for the consideration of such a scientific association as yours, still I may, at least, by promoting discussion, succeed in eliciting information.

Composition of Food.

Food, in order to furnish the proper elements of repair, must contain certain proportions of albumenoids, carbo-hydrates, fat, salts, and water.

Albumenoids.—As every tissue and liquid in the body concerned in the exhibition of force is nitrogenous, we may infer that the more the physical powers of a horse are taxed, the larger must be the supply of albumenoids in the food, a fact which is well proved in practice. When an animal's powers are fully exerted from day to day, he will actually eat a smaller bulk than he would do in a state of comparative idleness, because a larger quantity would unduly impede the action of his abdominal muscles—particularly the diaphragm—which are used in respiration. Hence the necessity, in such cases, of an increase in the percentage of the albumenoids rather than a greater amount of forage. This rule is abundantly proved by the good effects observed from the addition of beans or pease, which are rich in nitrogen, to the food of hard-worked horses, whose powers of assimilation are somewhat impaired by age; and also by the results of experiments conducted on a large scale with maize in France and Austria. It was found that although horses readily eat this grain, and on it get fat and acquire glossy coats, they show a marked deficiency in vigour, speed, and stamina, compared to animals fed on oats. Professor Bruckmüller, who conducted a six months' trial of feeding 5,200 horses partly on maize, found that it could be used with advantage only with those that are not required to move out of a walk; in fact, horses whose respiration is not hurried. I may remark that had the experimentalists combined 7 parts of beans with 25 of maize, they would have obtained a mixture equal in value almost to oats, which contain 12 per cent. of albumenoids, while maize and beans respectively hold 9·5 and 25·5. Maize not alone contains a comparatively small percentage of albumen, but even a part of that, being in the hard outer covering, is incapable of solution.

Although the art of combining grains so as to form a suitable food for horses is not of very special use in this country, where oats, beans, and hay are the staple forage, still it is of great importance to those of us who may have to travel in foreign lands, where, singly, none of the indigenous grains may form an appropriate food, while a judicious mixture of two or more of them would make an excellent article of diet. As a case in point, I may mention that about four years ago, I went to join my regiment in Cachar, a district in Eastern Bengal. I found that the natives there fed their ponies on paddy (unhusked rice), which, being indigenous, was very cheap. The European residents generally used gram, a kind of pea, which was about twice as dear as the rice; while a few who did a little racing, actually had oats imported from a distance of nearly 1,500 miles. The oats were about double the price of the gram. I may remark in passing, that the percentage of albumenoids in unhusked rice is about 8, and in gram 24. I found that my horses could not do hard work on rice, and that gram was too 'heating,' owing to its large percentage of nitrogen, while oats were too dear. Hence I resolved to make a mixture of 21 parts of rice and 7 of gram, which would be, approximately, similar in composition to oats, and at about one-third of the price. The experiment was entirely successful.

We must, of course, admit that although certain grains may possess the proper constituents for building up tissue, yet from certain causes—as, for instance, the viscid nature of wheat—they may not be suitable as a food, still no grain can serve in that capacity unless a due percentage of these elements be in it. Assuming 6 lbs. of oats as a minimum daily allowance of forage for a horse on which to keep in good condition in comparative idleness, and 14 lbs. of oats with 4 lbs. of beans as a maximum for one in hard work, we

find that the limits of the daily amount of albumenoids may vary between ¾ lb. and 2¾ lbs. If the only grain procurable be a highly nitrogenous one, the quantity should on no account exceed that which contains 2¾ lbs. of albuminous matter. Any advantage to be obtained by the necessarily increased supply of starch and fat would be more than neutralized by the deleterious effect the unassimilated albumen would have on the animal's system.

I had lately the pleasure of listening to a very interesting lecture in the Watt Institution, by Mr. D. M'Alpine, on his visit to the well-known experimental farm of Rothamsted belonging to Dr. Lawes. Mr. M'Alpine pointed out that it had been demonstrated by Dr. Lawes, in the feeding of cattle, that increase of weight does not depend on the amount of albuminous matter in the food, provided that it is not below a fair practical allowance, but that it is directly proportionate to the quantity of the non-nitrogenous elements. This is entirely in accordance with Mr. Banting's celebrated anti-fat doctrine, and also with my own experience among horses.

In this brief discussion of food I have purposely confined my attention to grain, to the exclusion of hay, as I consider that, within reasonable limits, a horse should get a full allowance of that forage.

Starch and Fat.—Although many physiologists regard albumenoids as the only essential constituent of food, we can practically prove that horses cannot support life without a proper supply of starch—a fact which we might readily infer from the consideration of the large amount of fluid that is excreted into the alimentary canal for the solution of starch. An oversupply of it, unlike that of albumen, is not followed by any baneful results, for what the system does not require appears to be excreted as fæces.

We have strong grounds for supposing that the presence of a certain amount of fat in the food is essential for the full development of the animal's physical powers, and that starch is not sufficient as an alternative element. The doctrine of the correlation of forces teaches us that heat may be converted into motion, and *vice versâ*. We find this to be as true in the animal economy as in the steam-engine. On account of the greater proportion of carbon and hydrogen, as compared to oxygen, there is in fat than in starch, there is a larger amount of heat generated in the oxidation of a given quantity of the former than in that of the latter. Apart from this, the presence of fat, as Professor M'Alpine pointed out to me, is essential to the activity of protoplasm. Besides, when a horse's powers are fully taxed, the blood pressure in the blood-vessels of his muscles is increased, and that in those of his organs of digestion is diminished, so that the solution of starch is not carried on so readily as it would be were the work easier. As the absorption of fat takes place simply by emulsification and saponification, it follows that fat or oil forms a most appropriate element in the food of hard-working animals. Miners, sailors, and other men whose daily vocations demand a large expenditure of muscular force, instinctively select a diet rich in fat, and eat with relish an amount of fat bacon, etc., from which a sedentary person would turn with disgust. The extraordinary performances of long-distance pedestrians of the present day, such as Gale, Weston, Rowell, and others, have been possible only under the modern system of training, which allows a large quantity of fat in the food. While our English athletes of previous generations ruined their constitutions and lost their matches by restricting themselves to stale bread and lean meat, the wrestlers of Asia have, for thousands of years, followed a system which is in thorough accordance with the most modern and enlightened views on dietetics, in that, when preparing for a contest, they make milk and butter their two chief articles of food. The development of muscular power attending this practice is most marked. I regret that time does not allow me to dwell on this very instruc-

tive subject, further than to point to the excellent results which may be obtained by supplementing the forage of hard-working horses with linseed, which contains 37 per cent of fat. It may be given—a little in each feed—in the form of meal, as a drink, or as a mash. The last and most common manner is, I think, objectionable when the linseed is mixed with other grain, which in this case will be swallowed without being properly masticated.

Mineral Matters.—The animal economy requires a constant supply of certain salts, not alone for the building up of tissue, but also to aid in the process of diffusion which goes on throughout the body. Although the horse can obtain, in the grain he consumes, all the albumenoids, starch, and fat his system requires, he is obliged to eat a certain quantity of hay from which to procure a sufficiency of earthy constituents, not including common salt, which should, as we shall see further on, be given, in addition, to him. In meadow hay there is four times the quantity of potash and soda, and nearly eight times the amount of lime in an equal weight of oats. The "cooling" effect of young grass is apparently due to the large amount of potash salts it contains. Bran, though a neglected, is a most valuable food, from its possessing a high percentage of phosphorus; in fact, five times more than oats, and seven times more than hay. It is somewhat inferior to oats in starch and fat, though richer than it in albumenoids, a portion of which, however, appears to be incapable of solution.

We are aware that the measure of a horse's appetite is by bulk rather than by weight, and that the heavier the oat the more flour and the less husk does it contain; hence the desire of owners of valuable horses to obtain oats weighing as much as possible, even though the price be greatly enhanced. I am led to think that a sample of sound oats weighing forty pounds to the bushel is quite as good, even for the training of race-horses, as one of forty-six pounds, which will cost half as much again; for although the latter contains in a given bulk a larger amount of albumenoids, starch, and fat, still it is poorer in mineral matters, which are principally found in the husk, the ash of which is almost identical in composition with hay, except that it contains more silica. My own experience is that horses on heavy oats will eat less corn and more hay than they would do with lighter oats. I am indebted to Mr. J. H. Moore, the well-known owner of "Liberator," for drawing my attention to this important point of stable management. I think we may safely say that when oats weigh less than thirty-eight pounds per bushel, it is too light for horses doing hard and fast work.

Common Salt appears to be the only earthy constituent indispensable to the full development of muscular vigour which is not supplied in sufficient quantity in the forage. The strong desire of herbivora in the wild state for salt, is shown by the fact that they congregate at, and travel long distances to reach, saline deposits which are found in various parts of the world. The results of many experiments prove the desirability of the addition of salt to the food. Ewald, in his "Lectures on Digestion," remarks that "the salivary ferment works best in a solution of sodium chloride," and that saliva acts most powerfully in a 4 per cent. solution of this salt, which also furnishes chlorine for the hydrochloric acid required in the stomach. He further points out that in ordinary dyspeptic conditions "it is not the pepsine which is wanting, but the derangement originates in the absence of the required acidity." As boiled food is readily swallowed without being sufficiently masticated, it should, when employed, be mixed before being given with common salt, which excites the flow of saliva into the mouth. A large lump of rock-salt left in the manger will meet all requirements, and will be found to lessen, if it does not entirely prevent, the practices of crib-biting and wind-sucking.

On the Preparation of Food.

It is universally accepted that *grain should be at least a year old before being used as a food for horses.* The chief changes wrought in it after being kept for some time are as follows :—(1) It loses a portion of its moisture, and on that account allows the digestive fluids to permeate more readily through its substance. (2) A part of the starch is converted into dextrose, which is the first stage in the process of its solution. (3) Various ferments which are essential to germination become developed in the grain after some time.

Although the process of *kiln-drying* desiccates corn and bursts its grains of starch, still it materially injures good oats, seemingly by reason of its rendering some of the particles of the corn so hard that they irritate the mucous membrane of the intestinal tract, and give rise to various derangements. The heat employed, as Professor M'Alpine points out to me, acts injuriously in destroying the vegetable ferments which assist in the solution of starch. Kiln-drying is frequently used to make inferior and mouldy oats presentable for market purposes.

It has been demonstrated by experiment that—(1) The drier the grain the more saliva is secreted; and (2) that food mixed with saliva, when passed into the stomach, is quicker and more completely digested than when moistened with water or any other liquid. Comparative physiology teaches us that the large size of the parotid glands of the horse proves the necessity, in his case, of thoroughly masticating his food. We are aware that whole grain is more readily swallowed than when crushed or bruised; hence we may take for granted that a horse's corn should, as a rule, be given to him in a dry state and bruised. The idea, so common among grooms, that bruised oats does not "put up" such hard flesh as when given whole, is too preposterous for serious discussion. If, however, it be not convenient to give the corn freshly crushed, it would be better to give it whole than to allow the bruised grain to become mouldy from its substance being exposed for any considerable length of time to the action of air and moisture. The foregoing remarks, and the fact, as Ewald expresses it, that the digestibility of a food, to a high degree, depends upon its penetrability by the digestive fluids, point to the conclusion that boiled grain is not a suitable article of diet for the healthy horse on which to sustain hard work—a result that is in agreement with the small size of the animal's stomach. Experience teaches us that the habitual consumption of a full amount of boiled food causes the function of that organ to become seriously impaired from continued over-distension. As a change, in case of illness, a small quantity of boiled grain may be prescribed with advantage; for a horse, when weak and fevered, will often shrink from the effort required to masticate dry grain, which, in a boiled state, may be readily swallowed. In such cases I think that the beneficial effect of the food thus prepared is chiefly due to its filling, more or less, the empty stomach. Being soft, it cannot mechanically irritate the intestinal canal; its substance is too small to do any positive injury; while its warmth may be grateful to the debilitated stomach. As the non-saturation of starch with saliva renders it liable to produce gastric derangement, we should in choosing grain to be given in a cooked or steamed condition, select one which is comparatively poor in starch; hence the utility of bran and linseed as a mash. The large amount of oil contained in linseed does not require any admixture of saliva. In making a bran mash we should use only just enough water to burst the grains of starch. It should on no account be given in a cold, "sloppy" state. A good plan for making it is to scald a wooden bucket with boiling water; put in about 3 lbs. of bran, with an ounce of salt; pour in as much boiling water as the bran will take up, which will be a little

over a quart ; stir up, and cover carefully over so as to keep in the steam for a quarter of an hour or twenty minutes.

In Southern India, a species of lentil called *koulthee*, given in a boiled condition, is used very generally with horses of all classes. It has to be employed in this manner, owing to the extreme hardness of its husk. The persons who use it have learned from experience that it is best prepared by boiling it with a minimum of water, and then giving it as dry as possible. The grave derangements resulting from the feeding of horses on maize is chiefly due to the almost flinty mixture of its outer covering. It may, so as to insure thorough mastication, be mixed with some bran and chopped hay.

In this connection I may mention that in Arabia, Syria, Egypt, and other Eastern countries, raw and unbroken barley is the staple food for horses. If this hard and irritating grain be given alone, it will render the mouths of the horses that are fed on it so sore that they will after a few days refuse to touch it ; while the chances are that the barley which they had already consumed will have induced, from irritation to the mucous membrane of the intestines, Diarrhœa, and even Laminitis, from sympathy. The natives of these countries, however, succeed in obviating all such dangers, and in utilizing to the fullest extent the nutritive properties of the barley, by mixing it with barley straw which has been bruised and broken up into small pieces, so that the *tibben*, as this chaff is called, is almost as soft to the touch as so much spun silk. These Eastern horses get no other food except barley and *tibben* for ten months in the year, and thrive admirably on it. Strange to say, imported English horses do equally well, as I had many opportunities of seeing while staying in Egypt for some time two years ago. The facts connected with this subject are worthy of your attention, for we find in India that when horses are fed on grain and ordinary chopped straw instead of hay or grass, they are extremely liable to become roarers, although Roaring is as practically unknown in India among horses that are fed on grain and hay or grass, as it is among Arabs whose food consists of grain and *tibben*. I am forced to the conclusion that the soft nature of the *tibben*, as compared to the sharp and hard character of the chopped straw, makes all the difference, the cause of the disease being irritation to the nerves which supply the mucous membrane of the pharynx, œsophagus, and stomach.

On the Routine of Feeding.

The small size of the stomach of the horse as compared to that of his intestines, and the fact of his liver possessing no gall bladder in which to store up bile to be discharged into the duodenum after a considerable interval of time, prove that he should be very frequently fed. The London cabman, whose horse performs an incredible amount of work, and frequently eats half a bushel of oats in a day, has found by experience that the only way by which to obtain the maximum amount of labour out of his dumb servant is to put on the nose-bag as soon as possible after he has discharged his fare. If time can be spared, a hard-worked animal should be fed at least five times a day ; a small feed being given the first thing in the morning, say an hour before he goes out, and an extra large feed the last thing at night.

A horse should have hay before him when he gets his corn, so that he may vary his food as his appetite prompts him, in the same way as we do with meat and vegetables at our meals. I have proved by long experience that a hard-worked horse will eat more corn given in this manner than he would do were he deprived of hay till he had finished his grain. I need hardly say that the same general rule as regards meat and vegetables holds good in

our own cases. If we find that the animal leaves the corn for the hay, we may feel sure that he obeys the promptings of an instinct which guides him to select the food most suitable to the requirements of his system, in that he rejects the more sapid of the two articles of diet. The usual result of stinting a horse of his hay is to force him to eat his bedding! The practice I advocate obviates the risk of irritation to the stomach and intestines by the presence of a quantity of stimulating food consumed *en masse*. The late Professor Dick was, I believe, the first to draw attention to the fact that the large size of the horse's intestines indicated that the bulk of the animal's food should be considerable as compared to the amount of nutriment it contained. In this view, as in many others, this great man was far in advance of his age, for it is only within the last few years that physiologists have recognised the worthlessness of concentrated foods.

With greedy feeders it is desirable to mix chopped hay or bran through their corn so as to make them masticate it more thoroughly. I have seen good results from the practice of giving "washy," slack-loined horses which are inclined to scour, some hay just before feeding, and also during that time.

After comments by Messrs. Weir (of Glasgow), Anderson, and Pottie,

Mr. CONNACHIE, in a few remarks laudatory of the pre-eminently high quality and practical nature and value of the paper, proposed that it be published in the professional Journals, where it could be read at leisure by the members, and be afterwards more profitably discussed. This was agreed to, and the meeting terminated with a vote of thanks to Capt. Hayes for his paper, and to the Chairman for presiding.

Subsequently upwards of forty members and visitors sat down to the annual dinner, and concluded in an enjoyable and social manner, what had been a most interesting and successful meeting.

R. RUTHERFORD, *Secretary.*

THE NORFOLK AND EASTERN COUNTIES VETERINARY MEDICAL ASSOCIATION.

THE half-yearly meeting was held on January 30th, at the Norfolk Hotel, Norwich; A. H. Santy, F.R.C.V.S., in the chair. The members present included Messrs. F. Low, G. G. Whincop, and A. Willows, Norwich; W. Shipley, Great Yarmouth; E. Barker, St. Faith's; J. Hammond, Bale; D. Rattee, Hapton; W. Ellis, Hempnall; G. A. Banham, Cambridge; T. E. Auger, Wymondham; J. K. Gooch, Holt; E. Barker, Aylsham; S. Smith, Lowestoft; D. G. Hunting, Loddon; G. C. Hunting, Stalham; J. Wright, Burnham Market; R. Paterson, Downham Market; and J. D. Overed, Blofield, hon. sec. As visitors there were present, Professor Axe, Royal Veterinary College, London; C. Williams, Esq., F.R.C.S., and S. H. Burton, Esq., F.R.C.S., Norwich; Thomas Greaves, Esq., Manchester; J. Mackinder, Esq., Peterborough; and A. B. Daniel, Esq., London. The minutes of the last meeting having been read and confirmed, the Treasurer submitted his report, from which it appeared that a substantial balance remained to the credit of the association after discharging all liabilities. The report was unanimously adopted. The election of officers for the ensuing year was then proceeded with, and resulted as follows:—President, Mr. J. D. Overed (Blofield); vice-presidents, Messrs. G. G. Whincop (Norwich), W. Shipley (Great Yarmouth), and J. Hammond (Bale); hon. treasurer and secretary re-elected. Mr. A. H. Santy was then unanimously chosen as the association candidate for a seat in the Council of the Royal College of Veterinary Surgeons at the election in May next, the members pledging themselves to use every legitimate means to secure his return.

The PRESIDENT then introduced Professor J. WORTLEY AXE to the meeting, who had kindly promised to read a paper on "Epizoötic Cerebro-Spinal Meningitis" in horses, which is comparatively a new disease in equine pathology, and possesses more than ordinary local interest from the fact that several cases had occurred in the county of Norfolk during the past year, some of which had been successfully treated by members of the association. The paper (as was to be expected, coming from such a source) was marked by great ability and deep research. In it the etiology, symptoms, pathology, and treatment of the disease were explained, and the *post-mortem* appearances lucidly described by the essayist. The disease appears to have existed for some time in India; but it was not till February last year that the first case (which occurred in Essex) was brought under the notice of the Professor. Shortly afterwards outbreaks occurred simultaneously in London, and in Norfolk fresh cases occurred at intervals up to the end of June. The attack in most cases is quite sudden, and without premonitory symptoms, while in a few instances it is otherwise. No age, sex, or condition, seems to be exempt, but the number of mares attacked is much larger than geldings; in the proportion of ten to one. It occurs under all conditions, circumstances, and system of feeding and management, but generally in cold weather and during sharp biting winds. A discussion followed the reading of the paper, in which many of the members took part, and the essayist having ably replied, a cordial vote of thanks was unanimously accorded to Professor Axe for his kindness in preparing his valuable paper on so important a subject, and a hope was expressed that the association might be favoured with another visit from that gentleman at no distant day.

Mr. OVERED then communicated a remarkable case of impacted colon in a three-year-old entire colt, which occurred in his practice a short time since, and which gave rise to an interesting conversation; the advisability of puncturing the bowel in such cases was freely discussed. One or two gentlemen mentioned cases in which the practice was attended with satisfactory results, while others stated that their experience of the practice was most unsuccessful, and one which they could not recommend.

A hearty vote of thanks was then given to Mr. Santy for his past valuable services to the association, and to Mr. Overed for his conduct in the chair, which those gentlemen severally acknowledged, and the meeting terminated.

The members and visitors afterwards dined together, and spent a very pleasant evening, an interesting feature in the after-dinner proceedings being the presentation, by Mr. Santy, of a valuable marble timepiece on behalf of the members, to Mr. Overed, who has held the office of hon. secretary to the association from its formation. Mr. SANTY, in a suitable speech, reviewed the history of the association, and the important part which the hon. secretary had taken, not only in its establishment, but also in its subsequent career down to the present date, and stated that the position which the association had attained amongst kindred societies, and the advantages which its members now enjoyed, were in no small measure due to the praiseworthy exertions of Mr. Overed, whose life he trusted would long be spared to render them further services as their president, and to enjoy the esteem and confidence of the Norfolk and Eastern Counties' Veterinary Medical Association.

Mr. OVERED, in thanking Mr. Santy and the members of the association for the valuable present which had been made that evening in recognition of his connection with the association as their honorary secretary for some years past, stated that while he neither desired nor expected any pecuniary reward, he could not feel otherwise than extremely gratified for this valuable recognition of his humble services, which it had been his privilege and pleasure to render to the association. This memento of their esteem was

much enhanced by the very kind expressions which had fallen from Mr. Santy in making the presentation, and also the manner in which those remarks had been received by the members present. He (Mr. Overed) wished to say that he entirely reciprocated their kind expressions and good wishes, and he should be happy at all times to render them any assistance in his power, and to place his humble services either as their president, or in any other capacity, at their disposal.

WEST OF SCOTLAND VETERINARY MEDICAL ASSOCIATION.

THE usual quarterly meeting of this Association was held in the Glasgow Veterinary College, on 25th January, 1882.

The President, Mr. Pottie, occupied the chair. Present :—Captain Hayes and Mr. R. Rutherford, Edinburgh; Messrs. Robinson, Junr., and M'Farlane, Greenock; Gardiner, Helensburgh; Bryce, Stirling; Lindsay, Alloa; Houston, Paisley; Blue, Mearns; Peddie, Cathcart; Wm. Anderson, Junr., Mitchell, Pollock, Hill, Glass, and the Secretary, Glasgow.

The minutes of the previous meeting having been read and confirmed, the election of office-bearers for the ensuing year then proceeded, with the following result :—President: Mr. Pottie, Paisley—re-elected, proposed by Mr. Anderson, seconded by Mr. Lindsay; Vice-Presidents: Messrs. Anderson, Kerr and Mitchell, re-elected, proposed by Mr. Bryce, seconded by Mr. Gardiner; Treasurer: Mr. Prentice, Glasgow; re-elected, proposed by the President, and seconded by Mr. Anderson; Secretary: George C. Hill, Glasgow; proposed by Mr. Lindsay, and seconded by G. H. Pollock. Carried.

Mr. MITCHELL proposed, and Mr. POLLOCK seconded, that Mr. Glass, of Glasgow, be elected a member of this society.

Professor MCQUEEN proposed, and Mr. HOUSTON seconded, that Mr. Milligan, of Parkhead, be also elected a member of this society. Carried.

Mr. BRYCE, Stirling, then read the following paper on "Inoculation as a preventive of Distemper in Dogs," and a few remarks on some recent cases of disease.

Mr. Chairman and Gentlemen :—In responding to what was asked from me, namely, to read a paper before this, the West of Scotland Veterinary Medical Association, I do so with a great amount of diffidence, knowing there are so many present older in the profession and much more able to relate their experiences or ventilate their theories than I am.

On thinking of a subject, I can assure you I have had great perplexity in making up my mind. I can tell you so little that is new, and that little not of very much consequence. At the last moment I made up my mind, *firstly*, to read a very short paper on "Inoculation as a preventive for Dog Distemper." *Secondly*, to describe a few cases which, though not perhaps unique, may be of importance to some of the younger members present, and may revive the memories of the older ones.

Gentlemen, it is, I believe, a natural failing, and a failing which is exemplified in the present instance, for a person to relate his successful cases, so I hope you will excuse me if I show egotism while doing so. Distemper in dogs is a disease which I have always taken a great interest in, because you might describe it as the most simple, and yet at the same time one of the most complicated of all diseases; the one day the dog is seemingly perfectly healthy, the next he is dull and sick, the third day he may present acute symptoms of catarrhal, lung, liver, intestinal or brain affections, all depending upon where the poison locates itself; it may vary from one organ to another or remain stationary; it may leave as sequelæ chorea, paralysis, etc. The treatment I will not touch upon, as you have just to give nourish-

ment and medicine when required, but I think as a preventive, that inoculation should be tried by every veterinary surgeon.

Inoculation is now recognised by competent authorities to be the great preventive in contagious disease. Vaccine matter from the cow has the power of preventing "Small-pox" in the human subject. In Anthrax, the blood being freed from bacteria by filtration, heat or antiseptics, and injected into the system, has the power to prevent the disease in question. Inoculation in Pleuro-pneumonia is extensively performed in some parts of England, I believe in most of the byres in London; while in Scotland, Mr. Rutherford, of Edinburgh, can testify to its efficacy: since, therefore, it is useful in these three very fatal diseases, I see no reason to doubt of its potency in Distemper. Inoculation with true vaccine lymph has been practised for a good number of years by country medical practitioners and empirics, who fully believe that it has the same powers with regard to Distemper as it has in Small-pox, though I for myself do not see any analogy betwixt the two diseases, with perhaps the exception of the eruption, which is present in both, though vastly different in appearance.

My attention was drawn to this subject, in the first place, by reading an article by H. Toussaint, Professor of Physiology, Toulouse, France. In it he describes experiments performed by himself in different animals (dogs included) with regard to Anthrax. He says: "I have assured myself that dogs from birth until six months old, very readily contract the malady by simple punctures, and that they die with great quantities of bacteria in their blood, while the local and gland lesions are extremely marked. Eight young sporting dogs, derived from three bitches, were experimented on. Four were vaccinated by the method I have adopted, the other four were not.

I so selected the lot that in each case there were brothers. The four vaccinated dogs resisted four consecutive inoculations by puncture or subcutaneous injections of Anthrax blood. The other four non-vaccinated dogs succumbed to the first inoculation in from two to four days, with considerable œdema around the point of inoculation, and the lymphatic glands in the vicinity swollen to from ten to fifteen times their original size. These glands were crammed with bacteria, while in the blood these organisms were more numerous than the globules.

At the first inoculation the dogs exhibited a slight amount of fever, and two had a very slight œdema at the seat of inoculation. The other punctures comported themselves as the most trifling wounds. In thinking over the result I obtained by these experiments, I determined on trying the same in Distemper. I inoculated three pairs of pointer puppies three months old. First pair with matter obtained from the nostrils of a dog which had died from the disease, another pair with serum from the lungs, the last pair by injecting blood through a hypodermic syringe behind both ears.

I took the blood from the same dog, and prepared it in the following manner: I put it in a small bottle, and boiled it over a slow fire for a quarter of an hour, then added a few drops of carbolic acid and water. This way of preparing it destroys the solid particles in the blood, which have been proved to be the true poison. In the two first pairs I clipped the hair of the skin below both ears, scarified it, and rubbed the matter in with the finger. On the fifth day the first two puppies were observed to be dull, and watering slightly at both eyes; the other four just exhibited slight feverish symptoms, and a little local inflammation at the parts operated on. These dogs are all alive at the present time, and have remained healthy up to this date; and as they are conveniently near me, I shall have the opportunity of noticing whether they are ever troubled with the disease or not. To judge from the results, I believe the injection of the blood is the best mode of

operating, as it appears to affect them least, the serum from the lungs being the next best. As these experiments are only the prelude to others, I will not say too much about them at the present time, but think that every one who has the opportunity should take some step in the same direction, and see what good will come out of it. I again repeat, that if inoculation in Anthrax, Pleuro-pneumonia, etc., is followed by good results, and which are caused by specific blood-poisons, I see no reason to doubt that the same operation, as a preventive for Dog Distemper, should not be followed by the same beneficial results. My remarks on the subject being brought to a close, I will now, with your liberty, proceed to describe a few cases which have occurred in my practice.

CASE I.—*Hernia of the Uterus in a Sow.*

While at a farm in the neighbourhood examining a horse, I was requested to look at a sow, which I was told had a big lump under its belly. On seeing her I perceived she was pregnant, and that this lump was touching the ground at every step she took. On manual examination, I found the skin broken and bleeding just at the umbilicus, and could distinctly feel the young pigs through the walls of the uterus. Seeing it was a case of hernia, and that it was caused by the over-weighting of the organ, I made a pitch plaster, and put it on with a firm bandage round the abdomen, and left her. In three or four days she had a litter of exceptionally large young pigs, all alive. She was fed and sold afterwards. This case is worthy of special notice. It is very seldom indeed that protrusion of such an organ as the uterus takes place otherwise than through the genito-urinary opening.

CASE II.—*Fracture of Metatarsal Bones.*

On June 19th, 1879, I was called to examine a foal at Keir Home Farm, belonging to the late Sir Wm. Stirling Maxwell. I found its mother had tramped on both hind legs. On examination I found the near metatarsal bone fractured in two different places, and the off bone fractured in one, both limbs being quite pendulous. As it was a filly foal, and out of a good mare, I was requested to do what I could for it. I first put the bones in apposition, rolled a linen bandage round each leg, then layer after layer of plaster of Paris bandages, removed it from its mother, and made a bed of chaff, with buckles fixed on it to strap the foal down. I recommended cow's milk diluted, with a spoonful or two of sugar in it, and ordered the foal to be shifted from one side to another twice a day. It took kindly to this treatment, and in less than a fortnight would take as much pure milk as was thought advisable to give it. I found it necessary to give a dose of castor oil every second day for the first week or two, but after that ordered oil cake to be broken down and given along with the milk, which kept its bowels right. On the 21st July I allowed it up on its feet; the skin was slightly broken over the hips, but healed up very quickly. I blistered her twice, which completely finished the cure. She is now a strong, valuable filly, the only blemishes left being the three bony rings where the fractures occurred.

CASE III.—*Fracture of Os Suffraginis.*

On the 30th July, 1881, I was called to J. Steven, Esq., Quarter House, Denny, to see a grey carriage horse, sixteen hands high, which had been out at exercise that morning. The horse being full of spirit had been prancing about a good deal, and while doing so became suddenly lame, so lame that it could scarcely be got back to the stable. On examining the leg I found the suffraginal bone fractured, but gave hopes of his ultimate recovery.

I put him in slings, bandaged the leg with plaster of Paris, and kept him slung up for two months, with feet resting on tan bark (which I think is the best thing for preventing concussion), then put him into a loose box, and blistered him three times. He is now at exercise every day, going nearly sound, and will shortly be at work. I beg to draw attention to the plaster of Paris, it is so much better than anything else I have ever tried; it fits so well to the parts, and fixes itself so quickly and so securely.

Case IV.—*Lead Poisoning in Cattle.*

On 8th January, 1880, I received a telegram from Mr. Lindsay, V.S., Alloa, to meet him at Mr. Sinclair's, of Tulligarth, Clackmanan, to see some stirks and two year olds which were very ill.

On our arrival we found three dead, and learnt that four had been buried a couple of days before. We examined the live animals first, and found them all presenting more or less the same symptoms, namely, a dull, heavy, emaciated appearance, hidebound, some of them with a very distressed cough and difficulty of breathing; others were paralyzed, whilst the worst were perfectly amaurotic when handled much, as when giving them medicine; they appeared stupid, and would sometimes fall over quite helpless; in fact, they presented all the symptoms of stomach staggers. When we examined the mouth, we noticed blue marks round the incisor teeth, whilst under the tongue at the frenum a well-defined blue mark was visible; in some of them the blue marks were continued away back inside the mouth. We came to the conclusion that it was Plumbism they were suffering from.

We then proceeded to make a *post-mortem* examination of the three dead ones. On opening the rumen we found nothing but some half-digested food. In the reticulum there were, I am sure, nearly two ounces of small wafer-like pieces of lead, with a large quantity of tacks, nails, etc.; the walls in some parts presented the same blue appearances.

The omasum was hard and impacted, but no lead was found in it. The abomasum was nearly empty, and had the same blue marks on its walls. The bowels were constipated, the contents being very dark. The three animals all presented the same *post-mortem* appearances.

Treatment. Administered 1¼ lbs. Magnes. sulph., with two oz. ginger in the first place, and ordered two drs. Sulphuric acid three times a day, along with plenty of gruel, and half a pound to three quarters of Magnes. sulph. every second day. This treatment had the desired effect, it opened the bowels, and converted the dissolved portions of lead into the insoluble sulphide. We continued this treatment till all the animals were completely recovered.

On inquiring how the animals were fed, the owner told us he had bought some cheap artificial feeding, called, "Palm Nut Meal," from a firm in Edinburgh. We examined it by washing, etc., and found quantities of lead intermixed with the so-called feeding stuff. We made inquiries at the Edinburgh house, and found they had received it as damaged stuff from some grain merchant's house in Liverpool, which had been burnt nearly to the ground. This explained the matter at once; the lead from the roof, etc., exposed to a melting heat, fell to the ground amongst the grain. I think the water from the fire-engine being pumped over the molten lead, had the effect of separating it into the wafer-like shapes in which we found it.

Case V.—*Nasal Osteomata.*

On Monday, 25th July, 1881, Mr. Lindsay and I were called to a farm in the locality to examine a three-year-old colt, which had been *roaring* for nearly a year back. During that time it continued to get worse, until it was quite unfit for work. Before the stable door was opened we

could hear him quite distinctly making a very loud roaring noise. On examining him we found the frontal bones greatly enlarged, with matter coming from both nostrils.

On looking up the near nostril we could see what appeared to be a tumour, and on introducing the fingers could easily take hold of its lower extremity. In the off nostril we could not see or feel anything, though quite sure it was diseased also. We told the farmer that an operation would be necessary. On our arrival next day we cast the colt, and proceeded to examine more particularly what was to be done. We tried to withdraw the tumour with the forceps, but found it was immovable; we could not get the forceps up any distance, so as to get a firm hold of it. We decided to trephine into the superior part of the nostril, about three inches from the eye, and see if the tumour grew from the very top or not. The instrument went right down on the tumour; but this was found to take its origin much higher up. We could feel it quite distinctly, and found it to be hard and bony. Seeing we could not dislodge it by the opening made, we cut right down through the fleshy part of the nostril, dissected away the skin, and with a small saw removed a piece of bone 1½ inch in breadth, right up to the aperture made by the trephine, and laid the tumour for our inspection; we then took the forceps and tried to get it away, but found we could only remove it by small fragments at a time, till all was removed. We washed it out with a pretty strong solution of carbolic acid, and ordered carbolate of copper injections twice a day. It then progressed so favourably that by the end of September all traces of the operation were entirely obliterated.

On the beginning of November we were informed that the other nostril was diseased in the same way, producing the same effects. On the 21st we cast him again on the other side, and found a tumour in the off nostril; in fact, it was nearly protruding out of the nostril, and required a similar operation. In this instance we found the tumour much more difficult to remove, the ossification being more complete. To remove it we found it necessary to make a hook, by means of which we succeeded in extracting it. It weighed fully half a pound, and must have been nearly or more than three quarters of a pound, if we had got it out perfectly whole.

The operation lasted a little over the hour. We ordered the same injections as in the previous case; the parts are now completely healed up, and the horse at the plough nearly every day. Now, would you call this a Polypus or not? A polypus is a tumour attached by a narrow pedicle; this case was not, the base being broader and thicker than at the extremity.

The opinion I have formed of it is this, the colt had a very bad cold about a year before, and shortly after that he began to evince symptoms of distressed respiration. We might describe it as a Duplex Osteomatous Tumour, caused by irritation and inflammation of the superior part of the septum nasi; an exudate was thrown out, cells were formed, first cartilaginous, then bony. This, at first a simple tumour, threw out two wings or branches, one going down each nostril, and gradually increasing in size, till they attained the large proportions they had when removed.

It is quite natural to suppose that the branches would take the downward course, both owing to the force of gravity and being the direction which offered the least resistance to their growth. When we compare this operation with that so ably described by Mr. Fleming in the VETERINARY JOURNAL for December, we find several points of special importance to be brought out.

In each case the tumour was Osteomatous, a very rare occurrence. In Mr. Fleming's case the tumour was single, in the other it was double; the first one was situated a short distance from the nostrils, while the latter took its origin at the highest part of the septum nasi; again, one weighed 4¼ oz.,

4½ inches long, 3¾ inches broad; the other one extracted was three times that weight, nearly twice as long, while in breadth they would be similar, that is, nearly filling up the cavity of the nostril. In Mr. Fleming's case the wire écraseur was useful, while in the latter case it was utterly impossible to use it. In fact, I do not believe it could have been removed by any instrument whatever, if we had not sawn away the bone and so opened up the nasal chamber that we could withdraw this very unusual tumour.

A short discussion followed, in which the speakers were Dr. Rutherford, Mr. Anderson, the Chairman and others.

GEORGE C. HILL,
Secretary.

YORKSHIRE VETERINARY MEDICAL SOCIETY.

THE annual meeting and dinner were held at the Queen's Hotel, Leeds, on the 28th January, the President, Mr. Joseph Freeman, in the chair. The following members were also present, viz., Professor Williams, Messrs. Naylor, Greaves, Carter, Anderton, Schofield, Walker, J. M. Axe, Scriven, Sowerby, Smith, Deighton, Snarry, Hardie, Tatam, Atcherley, Bowman, Toop, Ferguson, and the Secretary.

The visitors present were J. Howell, Rochdale; W. Whittle, Worsley; W. H. Coates, London; T. Taylor and S. Locke, Manchester; Cheesman, 5th Dragoon Guards; and Wormald, student, York.

Apologies for non-attendance were received from Messrs E. C. Dray, James and John Freeman, Danby, Bale, Fallding, Parlane, Walker, Kirke and Nettleton: also from J. and A. Lawson, and E. Faulkner.

The minutes of the previous meeting were read and confirmed.

The Secretary read a letter he had received, desiring to know the opinion of the members with regard to the formation of a new Veterinary Journal, in order that the proceedings and discussions at the meetings of the different Veterinary Medical Societies may be published more fully. After some discussion, in which Messrs. Greaves, T. Taylor, Whittle, Atcherley, the Secretary and Professor Williams took part, Mr. Atcherley gave notice of a motion for discussion at the next meeting: "That it is desirable a new Veterinary Journal should be instituted, and that the members of this Society support the project."

A communication from the Southern Counties Veterinary Medical Society, desiring the co-operation of this Society in a proposed testimonial to Mr. Fleming, was read. After some discussion, the Secretary gave notice of a motion for discussion at the next meeting as follows:—"That this Society cordially joins in the movement having for its object the substantial expression of the thanks of the Profession to Mr. George Fleming, for his unwearied labours in connection with the obtainment of the Veterinary Surgeons' Act."

A unanimous vote of thanks was awarded to Mr. James Freeman for his services in the Council, and that, should the state of his health permit, he would allow himself to be nominated as a candidate at the ensuing election.

In the event of Mr. Freeman declining office for another term, it was decided to nominate Mr. Broughton.

The President then read his Inaugural Address as follows:—

Gentlemen,—I have to thank you most sincerely for your very unexpected kindness in unanimously electing me as your President for the current year, and I trust that I may be able to carry out the duties appertaining to the office, so as to merit your entire approbation, also with credit to myself; thereby emulating the labours of my numerous friends who have honourably preceded me in this office.

I have had the great privilege of being a member of this Society since its commencement, and although, owing to my residing at such a long distance from Leeds, and the exigencies of a wide country practice, I have not been such a constant attendant at the meetings as I should have wished, yet I have always felt the deepest interest in the well-being of this Society, and I am proud to be able to state from this chair that our Society is at the present time numerically and financially stronger than at any period of its career; but at the same time, I regret to state that there are a great number of our professional brethren residing in Yorkshire who do not belong to us, who really could well afford to come amongst us, and would be a credit to us. From the southern part of the county especially, we have been badly supported, and I should be delighted to see our number considerably augmented.

The continued success of veterinary medical societies is exceedingly gratifying; the old societies are all on a firm basis, and one or two new ones have recently sprung into existence, thus clearly showing the beneficent results accruing from numbers of our professional brethren uniting in order to carry out their best interests, both collectively and individually. The year 1881 will ever be a memorable one in the annals of the veterinary profession in Great Britain, for we have now been properly recognized by Parliament as a body of professional gentlemen, and we have had granted an Act of Parliament giving us certain privileges, and empowering us to inflict pains and penalties upon unlicensed persons who usurp those privileges. There is no doubt that the Bill does not satisfy everybody, and will probably not much benefit the senior members of our profession; still, I think that in the course of a few years the Bill will be a great boon to the profession. Upon calm reflection, it was scarcely to be expected that Parliament would give us retrospective power, and coolly snuff out numbers of unlicensed men who have been practising the veterinary art as a means of livelihood; and we shall, therefore, have to content ourselves with the fact that we are in rivalry with men who have never received any collegiate instruction, but simply act from their own "horsey" acumen.

Well then, gentlemen, the Legislature having duly licensed us as a body of professional men, it remains for every individual member of the College so to regulate his private and professional conduct that he may be received into society as a scholar and a gentleman; because I am of opinion that upon our own good conduct will depend whether Parliament will grant our profession any further boons. Up to the present time Parliament has done very little to aid the onward progress of the veterinary profession. I sincerely hope that very shortly we may receive a grant from the public funds to enable us to purchase a building worthy of being designated the Royal College of Veterinary Surgeons. I have noticed with feelings of astonishment and regret, that the lawyers have decided that the Council have no power to make laws for the enforced practical instruction of the student before going to a veterinary school, and it is very unfortunate that a clause empowering the Council to enforce practical instruction with a member of the College was not included in the Veterinary Surgeons' Bill. It is quite impossible for numbers of young men to become thoroughly practical veterinary surgeons by only studying at a veterinary school, because the opportunities of seeing daily practice at some schools is only limited, and not sufficiently varied in its character.

I think that power should also have been obtained, enabling the Council to equalise the preliminary examination at all schools. Gentlemen, I think we should be guilty of a gross dereliction of duty if we were to allow the present opportunity to pass without expressing our hearty thanks to Mr. Geo. Fleming, the President of the College, for his unwearied labour and

untiring energy in superintending the passage of the Veterinary Surgeons' Bill through the Houses of Parliament; and I beg to move a resolution to that effect.

I would endorse the words of the President of the Scottish Central Veterinary Association: "That this meeting, recognizing the many great benefits conferred upon the profession by Mr. George Fleming, desire to put on record their appreciation of his great services; to tender to him their gratitude, their united and hearty thanks, for his indefatigable labours and magnanimity in securing this Veterinary Surgeons' Bill. That this resolution be recorded in the minutes, and a copy transmitted to Mr. Fleming by our worthy Secretary."

The British National Veterinary Congress held in London last July, proved to be a good success, despite the unfortunate secession of our Lancashire and other northern friends. I think it was a very foolish act on the part of the Council of Congress, to enforce the invidious comparison between the Royal College and the Highland Society's men, and I am also of opinion that it was still more foolish for our northern friends to withdraw their support from the Congress upon that account, because the Highland Societies' men having had the portals of the Royal College opened unto them for the payment of a nominal sum, one guinea, I say that all those who will not comply with this offer are not worth one moment's consideration, regarding any movement that may be brought forward in connection with our profession. Had it not been for the unfortunate secession I have spoken of, the Congress would really have been a splendid gathering of the members of the profession. I notice that the principal practical subject discussed at the Congress, was the very difficult topic of Soundness and Unsoundness in Horses, and although no direct rules could be framed to guide us in our opinion, the discussion was exceedingly profitable to those gentlemen who were fortunate to be present. If we take for instance, the question of spavin or no spavin, how can we wonder that our young friends are often baffled in arriving at a satisfactory opinion as to the condition of the hocks, when we find our senior friends at issue upon the same subject? There is such a variety in the conformation of hocks, that it is occasionally exceedingly difficult to distinguish between hereditary conformation and osseous deposition. I am afraid that it is quite as impossible to expect veterinary surgeons to agree upon various points, as it is to expect medical gentlemen, engineers, and others to agree in their opinions. I think that our Veterinary Anatomical Professor should be exceedingly strict in enforcing every student to learn the correct anatomy of the horse's hocks, it ought to be a *sine quâ non*. You will all doubtless have read with the greatest interest of the wonderful experiments lately carried out by Monsieurs Arloing, Cornevin, and Thomas at the Lyons Veterinary School, whereby the poison of Anthrax may be passed through the system of an animal by vaccination, thereby rendering the vaccinated animal proof against an attack of the malady. In fact, so conclusive are the researches and experiments of these gentlemen, that the French Government have already instituted a system of compulsory vaccination. The wonderful and untiring researches of that great labourer in the field of chemico-physiological research, Mons. Pasteur, have shown that the poison of splenic fever may be so modified and passed through the system by vaccination, as to render animals proof against the ravages of this hitherto deadly affection. It is, therefore, to be sincerely hoped that our unfortunate agricultural friends will shortly be rid of some of those deadly maladies which affect the Bovine race, and thereby enable them to compete successfully against their foreign rivals in trade. I observe with pleasure that the Royal Agricultural Society have granted the sum of £250 to enable a committee of gentlemen and veterinary surgeons to carry out experiments in

connection with that pest to the stock-keeper, the Eczema Epizoötica; and I trust their experiments may throw a flood of light upon this troublesome affection.

I perceive that this enquiry has the approval of Earl Spencer, but I don't perceive that he is aiding the experiment by a grant of money from the public funds. I think that I have exhausted my statement upon the present occasion. I trust that every member will attend the meetings as often as possible, that we may have volunteers to read papers for discussion, that the debates may be scientific and practical, and that all will cordially support the Chair to the utmost of their ability.

He concluded by moving the following resolution:—"That the hearty thanks of this meeting be given to Mr. G. Fleming, for his unwearied labours in connection with the Veterinary Surgeons' Bill." Carried with acclamation.

Professor Williams, in proposing a vote of thanks to the President, took the opportunity of saying tnat he was still of opinion that the Apprenticeship Clause is totallv unworkable; but he thought a student having passed theoretically might be put back, in order to acquire more practical knowledge. Mr. Carter seconded the vote of thanks. Carried unanimously.

At the dinner the usual loyal toasts were duly honoured, and some Veterinary political topics were ably descanted upon by Professor Williams, T. Greaves, W. Naylor, and T. Taylor, etc., etc.

W. BROUGHTON, *Secretary.*

ROYAL VETERINARY COLLEGE.

THE usual quarterly meeting of the General Purposes Committee was held in the Board-room of the College on January 9th. Present: Mr. Bereus, Chairman; Sir Paul Hunter, Bart., Mr. Harpley, Mr. Collins.

The minutes of the last meeting having been read and signed, cheques were drawn for the salaries and accounts for the quarter ending December 25th, 1881.

The Principal's quarterly report was read. With regard to obtaining a renewal of the lease of the College premises, it was reported that the Chairman and Secretary had seen the solicitors to Lord Camden's trustees, and also those to the Ecclesiastical Commissioners. A letter was read from Messrs. Clutton, surveyors to the Commissioners, stating that negotiations were in progress for a division of the property (of which the Royal Veterinary College formed a part) now jointly held by the Ecclesiastical Commissioners and Lord Camden's trustees, but that they could not say when these negotiations would be concluded.

It was ordered that the subject be brought forward again in six months time.

Various alterations in the regulations relating to the Government of the College, made 10th October last, were confirmed, after which the names of eighteen new subscribers were submitted, and they were declared elected.

NOTTS CHAMBER OF AGRICULTURE AND AGRICULTURAL SOCIETY.

AT the meeting of the above Society, held at Nottingham on February 4th, allusion was made by several speakers to the Veterinary Surgeons' Act, and the profession will obtain from them a faint idea of the obstacles that had to be overcome, and the manner in which they were finally surmounted. Mr. Nicholson was one of its most determined opponents, and the President of the R.C.V.S. could not induce him to remove his "block" to the Bill.

At this meeting he said as that was his first appearance amongst them he wished to say a few words. In the course of his observations he referred to a subject with regard to which he took a prominent part last session, and which had been in a great measure overlooked by agriculturalists. His attention was drawn to a Bill called the Veterinary Surgeons' Bill, and he received a letter from the Prevention of Cruelty to Animals Society in Nottingham asking him to support that measure. After that he obtained a copy of the Bill and read it through very carefully, and when he came to the 17th clause he came to the conclusion that with that clause in it it was a Bill that would act prejudicially to the agricultural interest. On that he put a block upon the Bill, and having done so, he was waited upon by several gentlemen who were anxious for the measure to pass, and who wished him to take off the block. He had some conversation with Mr. Storer, Mr. Chaplin, and others, who, he must say, took the same view as he did with regard to the measure. Presently Mr. Newdegate, the member for Warwickshire, came to him and almost implored him to take the block off the Bill, but he told him the objection he had to the 17th clause, and he (Mr. Newdegate) wished to talk the matter over with him. At that time, however, he failed to see the clause in the light that he (Mr. Nicholson) saw it in. The clause was as follows :—"If after the 31st day of December, one thousand eight hundred and eighty-three, any person, other than a person who for the time being is on the register of veterinary surgeons, or who at the time of the passing of this Act held the veterinary certificate of the Highland and Agricultural Society of Scotland, takes or uses the title of Veterinary Surgeon or Veterinary Practitioner, or any name, title, addition, or description stating that he is a veterinary surgeon, or a practitioner of veterinary surgery, or of any branch thereof, or is specially qualified to practise the same, he shall be liable to a fine of not exceeding £20. From and after that same day a person other than as last aforesaid shall not be entitled to recover in any court any fee or charge for performing any veterinary operation, or for giving any veterinary attendance or advice, or for acting in any manner as a veterinary surgeon or veterinary practitioner, or for practising in any veterinary surgery, or any branch thereof." On the face of it that clause was very objectionable, for they would see that the ordinary village farrier or cow-doctor could not be called in when they wanted his assistance without incurring a fine of £20, nor could he recover in any court. Well, this Bill had passed the House of Commons in the shape in which he had read it, and it was now the law of the land, though he believed that there was hardly a farmer in the country who knew anything about it. On the last Saturday of the session it was passed, when there was a sitting which was understood to be a mere formal one for the business of supply. He afterwards saw Mr. Newdegate, who did not know that the Bill had then been passed, and he told him that he had come to entertain the same view with regard to the 17th clause as he (Mr. Nicholson) did. They afterwards had an interview with Mr. Mundella, who was asked to take steps to have the clause modified ; but he refused to do anything in the matter, saying that the Government had determined to get the Bill passed, and if any modification of the clause was required a Bill must be brought in for that purpose. He thought it his duty to bring this matter before them, and from them he hoped it would reach the Central Chamber.

Mr. ALLSEBROOK said this was another illustration of the good which might be done by Chambers of Agriculture. If this Bill had been brought before the Chambers they might have made such representations that it would not have been passed. It was evidently a mischievous Bill, and if in the future there was an opportunity of bringing in a Bill to neutralize that clause it would be well.

The CHAIRMAN said, before putting the resolution, he would like to make a few remarks, especially as there was a question before them in which he was personally concerned. With regard to the Veterinary Surgeons' Bill, to which Mr. Nicholson had alluded, he agreed with what had been said, and thought it would have been a good thing to block the Bill effectually. This was one of the greatest arguments they could have in favour of the appointment of a Minister of Agriculture. If there had been such a Minister a Bill like that could not possibly have passed. (Hear, hear.)

Obituary.

WE regret to have to record the death of J. Ward Headley, M.R.C.V.S., of Richmond, Yorkshire, who graduated in 1863.

The registrar of deaths at Kilmarnock reports the decease of J. Currie, M.R.C.V.S., a graduate of 1876.

Notes and News.

VETERINARY HONOURS.—The veterinary profession will receive with much gratification the announcement that, by decree of the President of the French Republic, and on the proposition of the Minister of Agriculture, Henri Bouley, Member of the Institute, and Inspector General of the Veterinary Schools, is promoted to the rank of Commander in the National Order of the Legion of Honour. This is an elevation in this most distinguished Order which no member of the profession in France has hitherto reached, and we give our cordial felicitations to our colleague who, as a man of science, and an eloquent exponent of comparative pathology at the Academy of Medicine, the Institute, and the Museum of Natural History, has done more to promote veterinary medicine than any other man in Europe. By this honour conferred on him, and so thoroughly well merited, his profession is honoured.

Another well-deserved honour is that conferred upon Professor Thiernesse, Director of the Brussels Veterinary School, and Secretary to the Royal Academy of Medicine, who has been promoted to the grade of Commander in the Order of Leopold. Two professors at the same school, Wekenkel and Gerrard, are appointed Chevaliers of the same Order. Bouley, Thiernesse, and Wekenkel, are Honorary Associates of the Royal College of Veterinary Surgeons.

The Director of the Munich Veterinary School, Professor Franck—another Honorary Associate of the Royal College—has had the honorary degree of Doctor of Medicine conferred upon him by the Medical Faculty of Munich, for his treatise on Veterinary Anatomy.

THE GOAT DISEASE IN SOUTH AFRICA.—The formidable contagious disease described in this Journal by Mr. Hutcheon, Colonial Veterinary Surgeon, is still seriously prevalent, though he is receiving every credit for his indefatigable and intelligent endeavours to stamp it out. The conduct of the farmers of Bedford and other districts has also been praiseworthy, as they have acted with energy, and made heavy sacrifices to get rid of the scourge. It is proposed to isolate the infected districts by drawing a circle of six miles around them.

WILD HORSES IN AUSTRALIA.—The few horses which, escaping now and then from the paddocks of colonists on the edge of the settled districts of Australia, have made themselves at home in the freedom and abundant pastures of the interior, have multiplied to such an extent that, notwithstanding the numbers captured or shot every year, it is estimated that there are something like 100,000 of them in the two most populous colonies—Victoria and New South Wales—or roaming the plains immediately contiguous to their borders. To European ears the proposal to have a day's horse-shooting sounds inexpressibly barbarous; but the Australian farmers near the interior regard the troops of wild horses which may often be seen trespassing on their enclosed lands as vermin. They do not possess any of the qualities which often make the wild horses of South American plains valuable, and besides destroying vegetation which might be made to support more valuable life, they not infrequently tempt the settlers' horses to join them and adopt a vagabond life. Worse than this, they are suspected of communicating diseases to settled districts. To meet the difficulty of dealing with the increasing hordes of wild horses, the Chief Inspector of Stock in New South Wales proposes that they should be classed as noxious animals under the Pastures and Stock Protection Act.—*The Colonies and India.*

Correspondence, etc.

THE ARMY VETERINARY DEPARTMENT.

SIR,—It is probably known to all members of the Army Veterinary Department, that a scheme for forming a local veterinary department in India is at present under the consideration of the Government authorities. The details of the scheme are now no secret, having been published in the Madras newspapers; but judging from conversations with and letters received from various army veterinary surgeons, it does not appear to me that the position in which those who volunteer for the Indian service will place themselves is by any means fully realized. I beg to be allowed, therefore, in the columns of your journal, to draw attention to certain facts in connection with that position, and hope that my doing so may be the means of preventing some, who intend to perform their duties honourably and conscientiously towards Government, from entering upon a career which will entail undreamt of hardships and loss of health.

Firstly. No provision for pension, or other compensation, is made for any period of service less than ten years; so that if their health fail and render them unable to serve in India after, say, nine years and six months, they will be turned adrift without any resources whatever, and probably with constitutions too much shattered to enable them to enter into private practice. Even if obliged to retire after ten and under seventeen years' service, they will receive only the miserable pittance of £70 annually.

Secondly. Nothing whatever is said about pension for their families. If the veterinary officer die, even while upon active service, after twenty years' hard work in India, his wife and family may be left destitute.

Thirdly. The prospect offered is one of unremitting slavery in an exhausting climate. All other officers, whether departmental or combatant, have a fair chance of obtaining their two months' annual privilege leave to the hills, by which both they and the Government gain greatly, in consequence of the renewed vigour with which they are capable of working after returning to their duties. The veterinary surgeon alone is debarred from this chance.

For the past five or six years veterinary surgeons in India have been able to obtain very little leave, owing to their numbers being insufficient for carrying on the work required of them. The consequences may be seen in

the large proportion who have died or returned to England sick, and in the great dislike with which Indian service is generally regarded.

Under the new scheme, the hope of even the smallest amount of any but sick leave will be well-nigh extinguished. The largest stations, containing both artillery and European cavalry, are to be supplied with only one veterinary officer, and one only is to be in charge of three or four of the smaller stations, which are in several cases hundreds of miles apart. It is at once evident that in neither of these instances could even three days' leave be safely granted to any one in veterinary charge, unless a substitute could be found.

Now what provision is made for supplying substitutes? There are to be only four supernumerary veterinary surgeons allowed for the whole of India. With more than sixty men to do the work, there have rarely or never been less than four absent from duty through sickness for many years past, but under the proposed scheme forty-two men will be required to do the same amount of work, and will therefore most certainly fall sick in greatly increased proportions.

Artillery and cavalry barracks are often at a considerable distance apart in Indian garrisons. The care of a large station, containing two or more batteries of artillery and a regiment of European cavalry, necessitates, as those who have tried it well know, riding about for many hours daily under a burning sun. But in addition to attending upon European troops, the veterinary surgeon is to give assistance when required to the Native cavalry, which is frequently picketed one or two miles from the other mounted corps. Nothing is said about extra compensation for this; and the words of the scheme may, and probably will, be so interpreted that no compensation can be claimed. Surgeons in India usually receive increased pay for work unconnected with their regiments or batteries, but the veterinary surgeon receives none that I am aware of.

When in charge of three or four of the smaller stations, the veterinary officer will be travelling almost continuously throughout the year, even if he visit each station on the average only twice every month, which is the least that can be required if he is to be of much real use.

To any one who has had considerable experience of travelling in India during the hot season, it will be evident that work of the above kind will ensure certain loss of health to nine out of ten men. I have myself served nearly twelve years in India. Those who know me there intimately will admit that I was quite equal to the average of Europeans in capability of working during the hot season; yet I do not hesitate to say that if still serving as a first-class veterinary surgeon in that country, I would not volunteer for such work as will be required from those who join the local department for 800 rupees monthly. I could not honestly go through the labour without my health breaking down.

What is the compensation offered for such incessant toil? The pay is to be increased for all more or less, but on the average it will be thirty-six rupees monthly more than at present. This sum is a drop in the ocean compared with the extra expenses to which a veterinary officer will be subjected for living at hotels, state bungalows, and railway refreshment-rooms, and for gharry hire about the stations which he will visit.

A friend here lately received a letter from a veterinary surgeon in India, stating that he had been travelling on duty for three weeks, during which his expenses had amounted to his whole month's pay; and for this all compensation had been refused, as only railway-travelling warrants are allowed by Government. He was thus subjected to an actual loss, in addition to spending all his pay, of the cost of keeping his horse and servants, and the rent of his bungalow.

Volunteers were readily obtained for the East India Company's service, and who were satisfied with their position, because the circumstances under which they lived were totally different to those of the present day. The chief attractions of an Indian career used to be, firstly, good pay as compared with the cost of living; secondly, moderate work; thirdly, a prospect of sport.

All these inducements have ceased to exist. Allowances which added considerably to the actual pay have been abolished, the expenses of living are far greater than they were, and the rates of exchange are so high, without a prospect of improving, that very little can be saved. Work is so incessant that there is scarcely any time for sport, and under the proposed system there will be none whatever—in addition to which, game is rapidly being exterminated. It will thus be seen that there is absolutely nothing to compensate a man for leaving his friends, and spending the best part of his life in an unhealthy country.

No one in his senses, who understands his profession, will deliberately sell himself to hard work in a tropical climate unless well remunerated, because, if willing to work in a temperate climate, he can make a comfortable livelihood without risk to his health. Duly qualified veterinary surgeons now settling in the United States usually make at least £400 in the first year of their practice.

Without doubt, the Indian Government is unaware of the extremely inhuman amount of work which will be required frem the veterinary surgeons if the proposed plan be carried into effect, for in the published details of the scheme it is stated that ordinary veterinary duties will be performed to a great extent by native salootries, who will be of course in charge of stations when the veterinary surgeon is absent.

It is a mystery to me how such an idea could ever have been entertained by those who know what the qualifications of salootries really are. I have been acquainted with numbers of them, especially with many who served under me in the late Bengal studs, and in the Punjaub while engaged in the horsebreeding department. They might be divided into two classes, the practical and the theoretical. The former had usually gained their knowledge of medicine while working for many years with veterinary surgeons in the studs, or with those of the East India Company's regiments, after which many had obtained appointments in the Bengal Cavalry. They were very useful men, and could generally treat ordinary cases of disease well. They could nearly always be trusted to attend to their work, but now and then made great mistakes. I have not found one of the very best of this class capable of detecting glanders or acquainted with the dangerous character of that disease.

These men had acquired nearly all their knowledge by years of sheer experience. They are now becoming very scarce, because the practical schools in which they learnt their business have been abolished.

The second class of salootries had gone through a course of lectures at the Hapur Veterinary School, where they certainly had a most efficient teacher of the theory of disease, and a chance of seeing a moderate amount of practice in the hospital of the Remount Depôt at that station. My experience of these men is that they could talk in the most fluent manner of "Pleuro-pneumonia," "Peritonitis," "Encephalitis," etc. (the longer the name the better), but were frequently unable to tell what was really the matter in an ordinary case of disease when they *saw a horse affected with it*, and were of course incapable of treating it rationally. It is surely unfair to officers who buy chargers for Government service at high prices, to leave them with no better veterinary aid than such men as these can afford, to say nothing of the losses which will inevitably result from leaving in their charge hundreds of regimental horses.

Natives of India have plenty of ability, and can undoubtedly be made skilful veterinarians, but only by the same means that are found necessary with Europeans, viz., by letting them go through a course of at least two or three years' study of anatomy, physiology, pathology, and *materia medica*, combined with some years' practical experience in the treatment of disease.

15*th Feb.*, 1882. J. J. MEYRICK, *Inspecting Veterinary Surgeon.*

PRELIMINARY EXAMINATIONS AT VETERINARY SCHOOLS.

SIR,—I think it requires very little reasoning to prove that examinations held at the Royal Veterinary College are unnecessary and bad in principle, but for the purpose of showing to those who have not taken the interest in the matter which it deserves, I will state some facts which I am of opinion will prove that it is best they should be altogether abolished. Errors are often allowed to exist until some instance occurs which clearly demonstrates the necessity for their removal. Firstly, to me it seems rather absurd that a man should be rejected at an examination, after three months' further study, having once passed the same. This is a frequent occurrence; a student passes the preliminary, goes to the R.C.V.S., is rejected, and then after three months' additional study, he gets disqualified at the preliminary. Having once passed the preliminary examination, I maintain that a man should not again be required to present himself for it; but on the next session coming to a close, he should be allowed to go direct to Red Lion Square. Secondly, some one, a few days back, suggested to me the possibility of partiality being shown towards students. Upon this I shall give no opinion. Thirdly, if I am rightly informed, it is not legal that a student should be prevented from presenting himself at Red Lion Square, provided he has attended the prescribed number of lectures. Fourthly, the College is not such a rich body that they can afford to step between a student going up to his examination, and say, "I am afraid you will be rejected, and you will consequently lose your fee; therefore we shall prevent you making an appearance." Fifthly, we seldom make a mistake when we imitate the rules, etc., of the *human* hospitals, and they have no preliminary examinations; they merely get "signed up" by the professors, intimating that they have attended the lectures, etc. Sixthly, and lastly, the Royal Veterinary Hospital is (or should be) *merely* a *teaching*, and not an examining body.

I beg to remain, yours respectfully,

"NIL DESPERANDUM."

THOUGHTS ON THE PASS EXAMINATION.

SIR,—The subject of final examination of the student occupied the serious and anxious attention of the Council of the Royal College for a considerable period of time at their last sitting. It is a subject of more than ordinary importance, and every attentive member of our profession feels a deep interest in it, since the character of our profession will mainly depend upon the proficiency of the men we licence to practice. Four professors, and some of our most eminent members, took part in the discussion; but as the proverb has it, "Many men have many minds;" there were differences of opinion on points of importance, as well as on matters of trifling detail. As the ventilating of the subject proceeded, the subject under discussion did not seem to become any clearer; many of the points under discussion seemed to be beset with difficulties, and confusion appeared to pervade the minds and the views of some of the speakers. I calmly viewed the proceedings, and resolved to bring the whole matter home; and here, in undisturbed quiet, try to think it out, and divest it of the mist that seemed

to surround it—lay down some landmarks. And on reviewing the ground, I would, in the first place, remark that the examiners must have afforded them every opportunity and sufficient time for them to form a true and thorough opinion of the student's capabilities. I maintain that no examiner, however smart and intellectual he may be, however great his experience may be, however quick in reading character and divining the student's thoughts and efficiency, he cannot do justice to himself and the student without carefully bestowing upon every subject a calm and quiet sagacity, that in its very nature must require time.

Whenever I think of the examiners, the remembrance of Dr. Sharpey always comes vividly into my mind. To me he was the *beau-idéal*, the model of an examiner; his venerable, benignant, benevolent face, and his manner, created at once a confidence in the mind of the student. The student felt that he was in the presence of a man with a large and kind heart; that he was in the power of a man who was incapable of doing a student an injustice. His habit was first to cast a frank, kind look upon the student, a look full of complacency, with a mixture of firmness and justice; then he would speak to him in a quiet, kindly, and friendly tone of voice some words of introduction. Then follows the questions, questions put plainly and clearly, taking pains to give the student no ground for excuse of not understanding him. I maintain that it is the bounden duty of every examiner that every question asked must be given calmly and deliberately, and every answer must be calmly, carefully, and justly weighed over by the examiner at each examination, but more especially so at the pass examination. It may not be considered of such a very weighty matter to the examiners, but to the student it is a momentous matter, a matter of life or death to him. I have heard of examiners who had an uncouth manner of blurting out catch questions in a sharp, harsh tone of voice, as if intended to strike terror and create confusion in the student (I am not now speaking of our court of examiners); it is a manner that cannot be too severely reprobated and censured: nor is it less indecorous to permit any approach to levity, flippancy, or familiarity by getting into an argument or controversy upon some subject you are examining him upon. This is certain to destroy the high respect essential in an examiner; it is a loss of dignity. This liberty may be attempted when the examiner is a young man, probably an equal in years, or of less age than the student he is examining. Hence the objection of a young man as an examiner.

I have heard it said that an experienced and expert examiner can tell what a student has in him by the time he has asked him three or four questions; but this is not by any means always the case. Some students are found dull to begin with; they soon make up, and are found to be diamonds in the rough. It was with very great pleasure that I observed the Council were drifting on in the right direction; that they decided to give the examiners an extension of time, viz., sixty instead of forty minutes to examine the student on the live subjects. I have studied this question many years, and felt a deep interest in it, and have always advocated an allowance of a longer time on this subject. It is unquestionably the most vital part of the examination. I hope and trust that the Council will make a new departure in advising a court of examiners composed of veterinary surgeons only.

It is to my mind quite immaterial which part of the examination is commenced first in the pass examination, whether it be the practical or the oral. The practical must of necessity have daylight; the oral can be done at any time. I am inclined to the opinion that it is a great advantage to the student, and also to the examiners, that there should be three examinations of the student. This question was definitely settled by the Council some

time ago, and the Colleges arranged their classes accordingly ; so that the first examination should take place at a certain specified period of his studies, and to embrace certain specified subjects, and if he passed on these he should have done with them, and not be examined upon them again. Having his mind released from them, he is at liberty the more fully and thoroughly to study the group of subjects he will be next examined upon ; the same with the second, and the same with the third. If he fails at any of these three examinations, then it is in the discretion of the examiners to say how long he shall be put back before he is examined again. I have spoken and voted in favour of this method on a former occasion, and would do so again for many excellent and important reasons.

The final or pass examination is unquestionably the most important of all. It is ostensibly an examination on pathology and surgery, and on these two subjects only. But all the subjects of his studies are so closely related, that he is supposed to give evidence at this examination that he has not altogether forgotten them ; if he fails to satisfy his examiners, I respectfully suggest that they withhold his diploma until the next general examination, when he shall be again examined on these subjects, and on these subjects only, on which he has failed to satisfy the examiners.

The present court of examiners expires this year, and a new court has to be appointed. If the Council decide to have none but veterinary surgeons on it, it would be an immense advantage, especially to the pass examination, where the services of every member of the whole court would be available ; instead of as now, when nearly one-half of the examiners are utterly incapable of rendering the slightest assistance, to say nothing of the very great difficulty of fixing the date of the examinations to suit the medical examiners.

Yours truly,

THOMAS GREAVES, F.R.C.V.S.

MALFORMATION OF PENIS.

DEAR SIR,—I send you the following account of a case of malformation of the penis of a mule, that came under my observation while attending the "Demalie" Cattle Fair at "Umritsur" in October last. The animal in question was a three-year-old native mule, about thirteen hands high, and my attention was first drawn to it by an artillery officer who was purchasing mules for one of the mountain batteries. The penis was protruded from the sheath for about five inches, and was bent in a direction backwards on itself at an angle of about forty-five degrees, so that the urine when voided was discharged between the hocks. The animal did not seem to suffer the slightest inconvenience, and the owner, a "Yat Sikh," who informed me that the malformation was congenital, appeared to expect as large a price as for any of the others that he had with him. Trusting that this may be of some interest to your readers, I remain, sir, yours sincerely,

JOSHUA A. NUNN, A.V.D.

Rawal Pindee, Punjab, *December 15th*, 1881.

A REITERATION.

IN our English contemporary for February, Professor Williams denies the correctness of the statement that he threatened the Council with the opposition of the Highland Society to the Veterinary Surgeons'-Bill. The statement, nevertheless, is perfectly correct. At the meeting of Council at which the pupilage by-law was discussed, he said, in effect, that "he would get the High-

land Society to oppose the Bill, if the Council insisted on imposing a pupilage on candidates for the diploma." Two other facts are equally patent: the Council passed the by-law as to pupilage, and the Highland Society opposed the Bill. The reference to this incident was not only warranted and justifiable, but, for certain reasons, was absolutely necessary, and therefore a duty.

MORBID SPECIMENS.

WE shall esteem it a great favour if veterinary surgeons will forward any interesting morbid specimens they may meet with, to the Brown Institution, Wandsworth Road, London.

Dr. Klein is now pursuing investigations in regard to Anthrax, and is particularly desirous of obtaining portions of diseased organs—as the spleen—from the bodies of animals which have been affected with that disease. As these investigations are of great moment, we are sure those who have the opportunity will gladly assist in promoting them.

TO CORRESPONDENTS.

A number of communications are unavoidably held over until next month.

Communications, Books, Journals, etc., Received.

Communications have been received from H. Rossignol, Melun, France; T. Greaves, Manchester; R. W. Burke, A.V.D., Woolwich; T. W. C. Toop, Knaresborough; E. Decroix, Paris; J. H. Steel, A.V.D., India; J. Mills, A.V.D., India; J. A. Nunn, A.V.D., India; H. Toussaint, Toulouse; J. J. Sperring, Dublin; A. Broad, London; "Nil Desperandum"; R. Rutherford, Edinburgh; T. Fraser, Newbury; G. Tegg and Son, London; J. J. Meyrick, A.V.D., Woolwich; A. Sievwright, Aboyne; A. E. Macgillivray, Banff; J. D. Overed, Blofield; G. C. Hill, Glasgow; M. Hedley, Darlington; M. J. Treacy, Lancaster, P.A., U.S.A.

BOOKS AND PAMPHLETS: *A. Lydtin*, Mittheilungen uber das badische Veterinärwesen in dem Jahren 1874 bis 1880; *A. Zundel*, Les Dangers de la Trichinose; *H. Bouley*, Le Progres en Médecine par l'Experimentation; *J. W. Schütz*, Die genuine Lungenentzundung der Pferde; *G. W. Sjöstedt*, Handbok i Forlossningskonsten för Veterinärer, och Uppfödare af Husdjur; Bulletin de la Société Centrale de Méd. Vétérinaire; Transactions of the International Medical Congress; Proceedings of the British National Veterinary Congress.

JOURNALS, ETC.: *Australian Veterinary Journal; American Veterinary Review; Revue Vétérinaire; The Journal of Comparative Medicine and Surgery; Annales de Méd. Vétérinaire; Journal of Medicine and Dosimetric Therapeutics; La Clinica Veterinaria; Wochenschrift für Thierheilkunde und Viehzucht: La Presse Vétérinaire; l'Echo Vétérinaire; Archives Vétérinaire; Journal de Médecine Vétérinaire et de Zootechnie; Der Thierarzt; Breeders' Gazette; Field; Lancet; Recueil de Méd. Vétérinaire; Pen and Plow; Repertorium der Thierheilkunde; American Live Stock Journal; Medical Press and Circular; Live Stock Journal; Medical Times and Gazette; Edinburgh Medical Journal.*

NEWSPAPERS: *Freeman's Journal; Syracuse Evening Herald; Glasgow News; Armagh Guardian; Nottingham Daily Guardian; Irish Sportsman; Irish Farmer's Gazette; Eastern Daily Press.*